

The Mining Journal

London, December 22, 1961

Volta Clears the Last Hurdle	645
Silver and Lead in Ireland	647
Future of the Tin Agreement in Doubt	647
Tests on Neyveli Lignite	649
Goa's Mineral Wealth	649

SPECIAL ARTICLES

World Iron Ore Production	650
Western Reefs Sinking Record	651
Solid Fuels in Latin America	653
New Cage Raising Method in Australia ...	655

MACHINERY AND EQUIPMENT

Crawler Mounted Reichdrill; New Coal Conveyor; Polish Method of Fighting Mine Fires; New Refractory Material	657
--	-----

MINING MISCELLANY

METALS AND MINERALS

Large Stocks Still Depress Manganese Markets; Platinum-Group Metals in the Third Quarter; U.S. and U.K. Silver Prices Rise; U.K. Wolfram Ore Market	658
--	-----

MINING FINANCE

Gold Fields, Expansion and Diversification; C.P.M.O. and the Indian Government; Teething Troubles at Ayer Hitam	661
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Volta Clears the Last Hurdle

THE announcement by President Kennedy that the U.S. Government has agreed to grant loans for building the dam and aluminium smelter removes the final obstacle in the way of the Volta River project, which is the cornerstone of Ghana's economic plans.

More than ten years have elapsed since consideration was first given to the construction of a dam and aluminium smelter on the Volta River, which was among the first projects put forward for the utilization of West Africa's potential sources of low-cost hydro-electric power for the production of aluminium. A White Paper published by the British Government in 1952 estimated the cost of the combined project at about £100,000,000 at the initial stage to produce 80,000 tons of aluminium a year and £144,000,000 by the final stage to produce 210,000 tons a year. A Preparatory Commission was appointed to consider the scheme and published a comprehensive report in 1956. As envisaged by the Commission, the project provided for the construction of a generating station with a power potential of 617,000 kW. and for an integrated aluminium industry with an eventual production capacity of 210,000 tons of aluminium ingot per year, the cost being estimated at £160,000,000 at initial stage and £230,000,000 at the final stage. The International Bank for Reconstruction and Development was invited to make a general assessment of the project with a view to financial participation. Its representatives visited the country late in 1956.

Since March 1957, when Ghana became an independent nation, Dr. Nkrumah has set his heart on the Volta project. Even his political opponents cannot but admire the determination with which he has sought to bring the project to finality without letting himself be discouraged by the new difficulties arising from such unfavourable factors as the setback to world aluminium consumption, the immense capital sums committed to major aluminium projects elsewhere in Africa (as well as in other continents), and to growing distrust among Western nations as to political trends in Ghana and the stability of the present regime.

At a time when the outlook for Volta seemed distinctly bleak, some encouragement was afforded by the result of an investigation undertaken by the Henry J. Kaiser Company. The Kaiser Report indicated that more power could be generated from the Volta River and also more cheaply than had earlier been thought. The Ghana Government accordingly accepted the recommendations of the Kaiser Report to site the dam at Akosombo (construction being estimated to take five and a half years instead of the seven to eight years previously proposed for a dam sited at Adjina), the smelter to be sited at Tema instead of Kapong. Tenders have been called for the construction of the dam which is to be undertaken by the Italian Impresit consortium. An agreement was drawn up between the Ghana Government and the Volta Aluminium Company (Valco) covering the construction and operation of the smelter. The members of Valco are Kaiser, Olin Mathieson, Reynolds Metals and Aluminium Ltd.

Here's a **NEW**

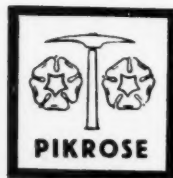
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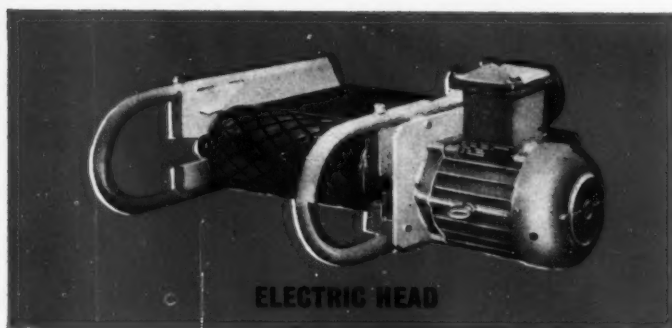
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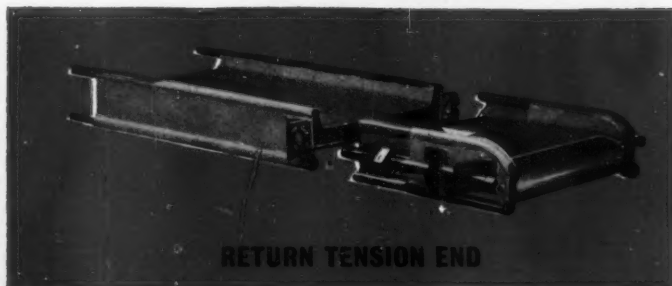
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The scheme, as currently envisaged, is expected to cost some £57,000,000 and there seems to be no question as to its being economically feasible, and the markets awaiting development on Volta's doorstep are potentially very large. Valco has been unable to obtain sufficient support from private companies, and the U.S. has been called upon for further help and guarantees. The Ghana Government has published a personal letter from President Kennedy to Dr. Nkrumah which seemed to pledge support. Washington's final decision, however, appears to have been held up for some weeks by political considerations, particularly disturbing to the Kennedy Administration being Dr. Nkrumah's silence on the subject of Soviet nuclear testing during the recent Belgrade Conference and his statements favouring Soviet policy on Berlin. Opponents of assistance for Ghana contend that American aid should be withheld from nations which, though nominally neutral, are hostile to the United States on vital issues. On the other hand, it is felt that the U.S. financial and technical assistance for the Volta project would benefit not merely Dr. Nkrumah but the people of Ghana and that to back out at this stage would cause the United States to "lose face" among the new nations of Africa. Moreover, Washington has not forgotten the setback to Western influence which resulted from the abrupt withdrawal of the financial support pledged to Egypt for the Aswan dam.

There will be considerable relief in other Western countries as well as in Ghana itself, that the arguments in favour of financial assistance for Volta have carried the day. Failure of the negotiations at the last lap could well have brought about the collapse of the Nkrumah Government and thrown Ghana into Russia's willing arms.

As it is, Britain is to provide £5,000,000, the United States some £12,000,000, and the International Bank for Reconstruction and Development £10,000,000. Ghana herself will provide the remaining £30,000,000. The agreement is subject to a wide set of conditions and undertakings which, it is believed, would fully protect the U.S. investment against future eventualities such as expropriation by the Ghana Government.

The loan for building the dam and power house is to be made to the Volta River Authority on a 50-50 matching basis with the Ghana Government. Membership of the Volta River Authority, which is under the chairmanship of Dr. Nkrumah, was announced last week.

A major contract for generators and transmission lines is due to be awarded by December 30. It is understood that several British interests have submitted tenders.

SILVER AND LEAD IN IRELAND

The discovery of seemingly rich deposits of silver and lead lying not more than 14 ft. beneath the surface in the Tynagh area near Loughrea in County Galway was announced on December 13. These deposits were located by the Irish Base Metal Co. which is a subsidiary of the Canadian concern, the Northgate Exploration Co.

Making the announcement Mr. P. J. Hughes, president of the Irish Base Metal Co., said they had so far only scratched

the surface but the deposits looked so rich that they could well change the entire economy of the west of Ireland. The concentration of lead was about 40 per cent and there was also a high concentration of silver.

Mr. Hughes, who crossed to Canada just after making his announcement, said the reports of the geophysicists indicated that the metal was there "for the picking up". Shafts will be unnecessary because the deposits can be worked on the open-cast system. When mining operations start, some 300 or 400 men will be employed but it is fully expected that the operations will eventually be on a scale large enough to warrant the opening of a smelting plant in the locality.

Round-the-clock test borings were carried out in the area over the past six weeks and the results were highly encouraging because not only were lead and silver located but also a "black mud" — so far untested — that according to spokesmen for the company has all the appearances of crude oil.

Lead mining was carried out in the Loughrea area more than a century ago and some traces of the old disused mines can still be seen in the district.

FUTURE OF THE TIN AGREEMENT IN DOUBT

One cannot fail to sympathise with the International Tin Council in the difficulties which have been besetting the second tin agreement. Aside from the operation of the agreement having been in virtual suspense since its commencement due to the exhaustion of the buffer stock, there is now an element of doubt as to whether the agreement itself will achieve definitive ratification.

It does not appear to have been generally realised that when the second agreement came into force on July 1, technically it did so only on a provisional basis, as insufficient participating governments had deposited instruments of ratification or acceptance by that date. Under Article XXI (4), provisional operation of the agreement may in any event only continue until June 30, 1962, and if by December 31, 1961, insufficient accessions to the agreement have been received, the chairman is required to convene an early meeting of the Council to decide whether to terminate the agreement at some earlier date. We understand that such a meeting has in fact been called for early in January, contingent on the agreement still remaining provisional at the year end.

For the agreement to come into force definitively, ratification is necessary by all six producer members of the first agreement and by at least nine consuming countries holding between them at least 500 consumer votes out of 1,000. Up to two days ago, both the Congo and Bolivia among producers had still to ratify, while among consumer countries only, eight ratifications had been received.

In view of the singularly unenterprising approach to its problems which the Council exhibited at its last meeting in October (*M. J.* October 20, Pages 386-9), it is not altogether surprising that ratification should be proving a slow process, at least in the case of the producers who are having to supply substantial funds for a buffer stock which there is

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no early prospect of being able to establish. Much more surprising, however, is the absence of consumer ratification, as the collapse of the second agreement must inevitably mean the end of any organized consumer influence on tin marketing in a period when all indications point to a prolonged sellers' market.

If the agreement does break down, however, it is difficult to visualize the producers taking no action to organize on their own. It will be recalled that President Kennedy, in his message to the President of Bolivia just prior to the I.T.C.'s October meeting, indicated among other things that it was not his government's intention to make any sales from the U.S. stockpile without prior consultation with the governments of tin producing countries. It would consequently seem a reasonable assumption that producing countries would find it expedient at least to form some *ad hoc* committee, both to simplify discussions between Washington and the countries concerned and equally to evolve a common policy *vis a vis* the stockpile which, Congress permitting, now seems likely to become the principal controlling influence on the tin price.

Incidentally, a common producer policy on price levels should be much easier to achieve today when the conflict between the interests of the low-cost and high-cost producing countries should logically have evaporated. Today, a country like Malaya, which in the absence of new discoveries has a finite and a relatively limited amount of tin still to sell, should be no less interested in maximizing revenue on every remaining saleable ton than is a high cost producer like Bolivia, which has plenty of tin if only it had the finances and management control to produce it. The demand for tin is notoriously inelastic and, although substitution will obviously tend to increase as the price rises, a ceiling of £1,200 still seems to us both safe and far more realistic than the £1,000, which the producers surprisingly proposed at the last I.T.C. meeting.

Those who regard a £1,200 ceiling as dangerously high should consider not only that this price might well bring out some more tin in the short term notably from Bolivia, but also that in the long run we may in any case have to learn to do without tin for many marginal uses simply because of non-availability. In face of such an eventuality, the sooner substitution away from tin in non-essential uses can be stimulated, the longer will tin be available at reasonable prices to do the jobs for which it is most needed.

TESTS ON NEYVELI LIGNITE

Laboratory tests for the production of iron through the electrical reduction process, by utilizing Salem iron-ore and Neyveli lignite have proved "very promising and encouraging", according to a report received by the Madras Government from Norway. The State Government, at the suggestion of the Union Government, had sent early this year 250 kg. of Salem iron ore and 100 kg. of Neyveli lignite for laboratory tests in Norway, to find out whether the new process of electrical reduction could be applied for production of iron.

A State Government official stated recently that the tests also revealed that raw lignite and briquette could be used, and both were suitable reducing agents for pre-reduction. Lignite briquettes were also found well suited for use in electric smelting furnaces. More samples would be sent to Norway to conduct tests on a larger scale shortly.

One thousand tons of Neyveli lignite had already been sent to East Germany for tests and another 1,000 tons were sent late in October. Two hundred and fifty tons of Salem iron ore were sent to East Germany for tests. These were expected to reach East Germany by the end of November or early December.

GOA'S MINERAL WEALTH

The invasion of Goa has focussed attention on the rapidly expanding mining industry of the small Portuguese colony on India's west coast. The production and export of iron ore and manganese has become one of Goa's principal industries. Deposits of these minerals are said to be so extensive that profitable development should be assured for several decades. Mining is almost entirely in the hands of the private sector and is being developed largely with the Japanese and German capital and technical know-how.

It is only in recent years that the development of Goa's mineral resources has been systematically undertaken by modern equipment and methods. An impetus to improve mining conditions and transport facilities for export was given to the industry by the Suez Canal crisis and by the Indian boycott of Goa in 1958. During the Suez Canal crisis, European customers sought to obtain their iron ore supplies from markets which were closer at hand, while the Indian boycott interrupted the normal flow of exports because the Indian ships which had previously carried the minerals refused to do so any longer. These two disturbances spurred the miners to seek better and more reliable means of transport and also encouraged the adoption of mechanical methods of loading ore.

Production has been steadily rising in recent years, amounting in 1960 to 4,700,000 tonnes of iron ore, together with 51,000 tonnes of manganese ore and about 123,000 tonnes of ferruginous manganese ore. The value of total ore exports amounted last year to 977,000,000 escudos (about £12,000,000) and in the first six months of the current year to 590,000,000 escudos. Iron ore production has been running this year at the rate of over 5,000,000 tonnes annually. The principal buyers have been Japan, Germany and Italy, but this year Metropolitan Portugal has been importing increasing quantities of iron ore from Goa for her new steel industry.

Japan's extensive purchases of Goan ore have not been altogether to India's liking; in fact, there were reports in 1958 that, due to political pressure, the Japanese had abandoned their plans to step up imports from Goa and had arranged to obtain their supplies from India instead. A new agreement covering increased shipments of iron ore was nevertheless signed by Japan and Goa and in September 1959, a Japanese mission arrived in Goa to arrange for the mining and export of iron ore and to survey the mines in which the Japanese were interested.

Last year Japan bought 2,600,000 tonnes of iron ore from Goa, equivalent to some 10 per cent of her total requirements. According to present plans, during the next few years her imports of iron ore from Goa should become second in importance only to those from Malaya and from 1965, Goa is scheduled to become her prime supplier, shipping the ore in quantities rising from 6,300,000 tonnes annually in that year to 10,000,000 tonnes in 1970. It is hardly surprising, therefore, that the Japanese steel manufacturers should be apprehensive as to the effects of India's invasion of Goa on future raw material supplies from this source. It seems by no means improbable that private contracts between Japanese and Portuguese interests will be regarded as void, and new agreements will have to be negotiated. While there are no fears that India will stop selling ore to Japan, Goa has been a cheaper source of supply.

West Germany imported 2,200,000 tonnes of iron ore from Goa last year, equivalent to about 8 per cent of total German consumption. German iron ore interests in Goa are in the hands of a subsidiary of seven German firms.

It is noteworthy that in 1960, for the first time, Goa had a favourable balance of trade, the surplus being due essentially to its expanding revenue from ore exports.

World Iron Ore Production

By JOHN WICKS

The following article presents a brief survey of world iron ore production during 1960. The statistics given are additional to those available at the time *The Mining Journal Annual Review*, 1961, went to press in May this year

OVER last year world iron ore production totalled some 513,300,000 tonnes with a total Fe content of 244,000,000 tonnes, or 47.5 per cent. This compares with a 1950 figure of only 245,100,000 tonnes of ore with 116,500,000 tonnes Fe content (also 47.5 per cent). Apart from this increase of over 100 per cent in world output during the past decade, certain drastic changes have taken place in the share of various areas in the overall total. Thus United States' production accounted last year for only 17.1 per cent of the whole as compared with a 1950 share of 40.4 per cent, while the share of Asia rose over the decade from no more than 2.9 per cent to 16.2 per cent. Europe, including the whole of the U.S.S.R., raised its share in world output from 49.2 per cent to 51.1 per cent, Africa from 2.9 per cent to 3.1 per cent and Central and South America from 2.3 per cent to 7.3 per cent, while Australasian production made up 1.0 per cent of the total in 1950 and 0.9 per cent in 1960.

Production and Trade Statistics

These facts are among figures contained in *Die Eisenerzwirtschaft der Welt in Zahlen (The World's Iron Ore Industry in Figures)* just published for the German ferrous metals body Wirtschaftsvereinigung Eisen- und Stahlindustrie by the specialist Dusseldorf publishing house Verlag Stahleisen mbH (*The Mining Journal*, September 8, 1961). The book contains production and trade statistics for the world as a whole for the representative pre-war years 1913, 1929 and 1938 and for all years from 1950 to 1960, comprehensive national statistics for producer and certain other countries, with particularly detailed information on West Germany, France and the E.D.C. and E.F.T.A. trade blocs, charted information on various aspects of the international and national iron ore industries and six maps showing main iron ore reserves. These maps in turn depict Europe excluding the U.S.S.R. and Turkey, Africa, North and Central America,

South America, Asia including the U.S.S.R. and Turkey, and Australia, New Zealand and Indonesia.

National figures of especial interest include the output figures for major producer countries for whom no information was available for *The Mining Journal Annual Review*, 1961. These include East Germany with 1,650,000 tonnes, Peru with 5,280,000 tonnes, Communist China with an estimated 60,000,000 tonnes and Goa with 4,000,000 tonnes. Further figures are for countries not there mentioned as iron ore producers, such as Belgium, Denmark, Portugal, Switzerland, Hong Kong, Pakistan, Cuba and the Argentine are also given, these being, however, minimal (i.e. not exceeding 300,000 annual tonnes). Parallel tables give actual Fe production of all nations and regional groups for which total ore output is given.

U.K. Supply and Demand

Interesting data shown in the tables concerning the United Kingdom are, apart from production, supply and consumption figures supplied by the British Iron and Steel Federation, tables from the same British source of U.K. iron ore imports from various countries for 1929 and 1938 and the period 1950-60, and consumption by various users of domestic and foreign ores. Iron ore reserves in the U.K. shown on the site map are those of Cleveland (30,000,000 tonnes), Cumberland (some 115,000,000 tonnes), Northampton (some 2,170,000,000 tonnes), North Lincolnshire (some 450,000,000 tonnes), Oxfordshire, Leicestershire and Rutland (some 70,000,000 tonnes), and Wales (some 25,000,000 tonnes).

Of particular topical importance are the joint figures for the Common Market and Free Trade Area blocs. According to these, the E.E.C. last year produced some 95,869,000 tonnes of crude ores of 27,526,000 tonnes Fe content, as against E.F.T.A. output for the year of 43,657,000 tonnes of crude

General view of the blending plant at Stanton, U.K. In 1959 The Stanton Ironworks Ltd. completed a comprehensive scheme for blending all incoming iron ores and sintering the fines before transport to the blast furnaces. Actual blending is by the Robins-Messiter system, and amongst the equipments installed in the plant are units by Mitchell Engineering Ltd., General Electric Co. Ltd., and Moxey Ltd.





Drilling for water at the site of the future iron ore mining town of Idjil, Mauritania. Mauritania's one hope of great wealth lies in her iron-ore deposits which are huge. An estimated 6,000,000 tons could be mined a year

ores with 19,493,000 tonnes Fe. In this context it is interesting that of the total E.E.C. output only some 2,515,000 tonnes of 1,150,000 tonnes Fe content had 42 per cent Fe content or more. In so far as total national ore outputs are concerned, West Germany recorded an average of 27 per cent Fe, Luxembourg 27 per cent Fe, Belgium 35 per cent Fe, France 33 per cent Fe and Italy 50 per cent Fe. Of the E.F.T.A. countries, on the other hand, Sweden and Norway each had averages of 60 per cent Fe, Portugal 50 per cent, Switzerland 40 per cent, Denmark 36 per cent, Austria 31/35 per cent and the U.K. 27/30 per cent.

World Deposits

Producer countries with the richest ores are Liberia with 55/67 per cent Fe average, the Dominican Republic and Thailand with 66 per cent Fe, Brazil with 65 per cent Fe, Chile and Venezuela each with 60/65 per cent Fe and Angola and Bulgaria each with 62 per cent.

The largest single iron ore deposits shown on the publication's continental maps are those of Mutun (Bolivia) with 10,000,000,000 tonnes, the Kursk magnetic anomaly (U.S.S.R.) 10,078,000,000 tonnes, Lissakova (U.S.S.R.) 7,000,000,000 tonnes and Middle Back Range/Eyre Peninsula area (Australia) 5,000,000,000 to 7,000,000,000 tonnes of ore. The main European deposits shown are those of Lorraine-Minette (France) with 4,235,000,000 tonnes (determined and probable), Gifhorner Mulde (West Germany) with 1,000,000,000 tonnes (determined and probable), Kiruna-Maara area including Tuolluvaara and Ekstromberg (Sweden) with 2,300,000,000 tonnes and Northampton area (United Kingdom) with 2,170,000,000 tonnes (determined and probable).

WESTERN REEFS SINKING RECORD

1,118 ft. in 31 Days

The establishment of a new world shaft sinking record at Western Reefs mine, South Africa, has been described as being noteworthy from two particular aspects. The first is that this sinking was accomplished with the equipment used at Vaal Reefs No. 2 shaft, reconditioned and with only minor modifications. The second was that the deciding factor in the Western Reefs record was the reduction of the time cycle per round. The sinking method employed at Western Reefs has been described in "The South African Mining and Engineering Journal"

DURING 1960, in view of the encouraging underground development results obtained from the Vaal reef in the north eastern portion of the Western Reefs property, it was decided to sink a large, deep shaft in this area, some 12,500 ft. north west of the No. 3 joint shaft serving this mine and Vaal Reefs.

Although it was desirable that the shaft be completed as early as possible to provide ventilation and services to this portion of the property, if possible the cost would have to be met out of working profits without affecting dividend distributions. This precluded the use of new and elaborate equipment, and it was decided to acquire the main items for sinking operations on the completion of the sinking of the No. 2 shaft system at that property.

Furthermore, as the new shaft will be used initially for ventilation and the transport of men and materials and for the hoisting of a limited amount of waste, only one permanent hoist of 5,200 h.p. was installed to be available for sinking operations. At a later stage, provision will be made for the handling of up to 45,000 tons of rock a month.

The excavated diameter of the shaft is 28½ ft. and lined 26 ft. which is the same as Vaal Reef's No. 2 main shaft and compares with 26 ft. excavated and 24 ft. lined at Hartebeestfontein No. 4.

The Sinking Pattern

Full scale sinking started on July 25, 1961, and an advance of 114 ft. was made during the remainder of that month. In August 718 ft. of sinking plus a 30 ft. pump chamber were completed, while work in September showed 835 ft. and a 30 ft. pump chamber.

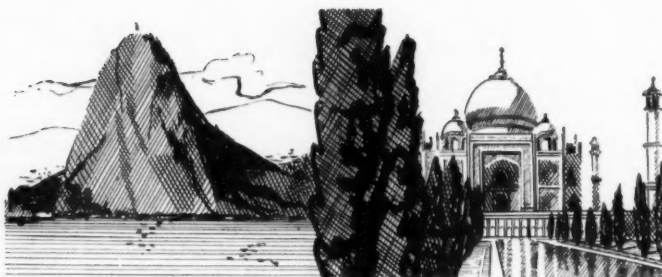
In the initial stages of the sinking, endeavours were made to break longer rounds to compensate for the smaller grab, kibbles and hoisting capacity available, but in the Ventersdorp lavas the anticipated results were not obtained. As a result of this and in consequence of the experience in this respect of other mines in the area it was decided to determine the best steel length that would give good breaking and reduce appreciably the time cycle per round.

In the early part of October it became clear that the optimum length was 100 in. 1 in. steel made by Boart and Hard Metals, which gave a hole length of 7 ft. 4 in. An average of 175 holes was drilled per round using 35 Seco 27 machines.

The use of shorter steel paid off, as is proved by the fact that 163 rounds were completed during the month, compared with 130 at Hartebeestfontein and at Vaal Reefs. This gave an average advance at Western Reefs of 6 ft. 10 in. in 4 hr. 4 min. (8 ft. 4 in. in 5 hr. 50 min. at Harties and 7 ft. 4 in. in 5 hr. 32 min. at Vaal Reefs). Consideration of the daily advance rate shows 36 ft. 1 in., 35 ft. 7 in., and 31 ft. 8 in. respectively.

A 20 cu. ft. cactus grab modified from Vaal Reefs experience was used and was operated by a D.M.B. electrically powered lashing machine.

SPECIAL REPORT...



ON MARION WALKERS from BRAZIL to INDIA

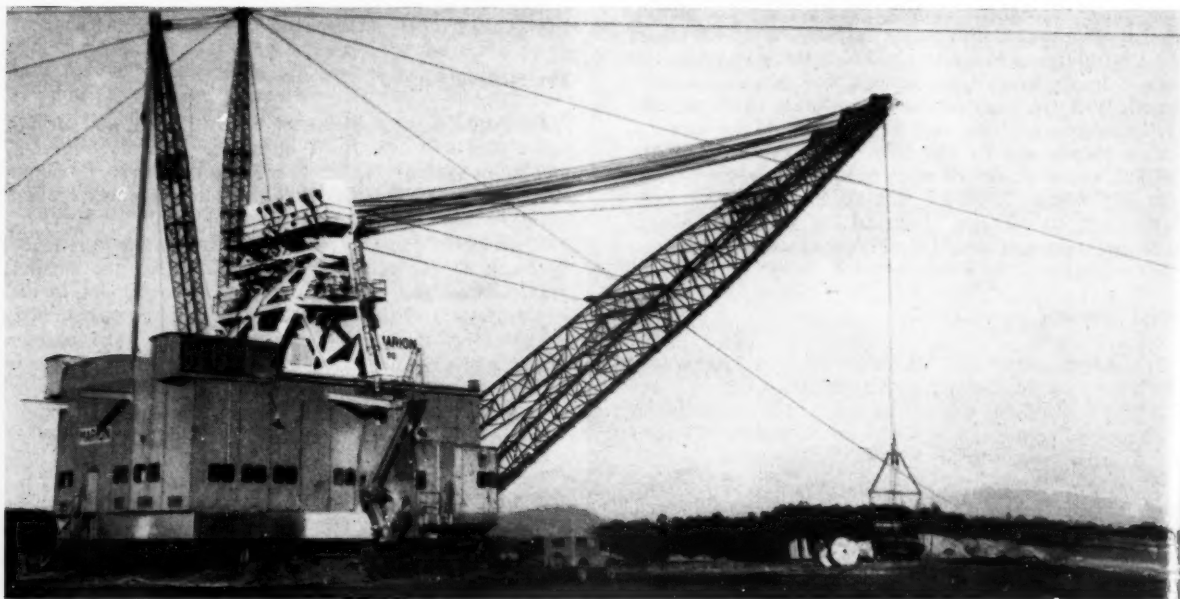
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Two other Marion 7800 Walkers have recently been purchased by India's National

Coal Development Corporation. Each will have a bucket capacity of 39 cubic yards. On arrival in India, they will be used to open a new N.C.D.C. strip mine at Bistrampur in Madhya Pradesh.

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Solid Fuels in Latin America

The following article provides a résumé on the solid fuels in those countries loosely described as Latin America and in this instance including Mexico, the countries of Central America, the islands of the Caribbean, and the countries of continental South America, including the Antarctic fisheries. The article is condensed from *International Coal Trade* Vol. 30, No. 10, published by the U.S. Bureau of Mines

THE conventional fuels in Latin America are, coal, petroleum and its derivatives, natural gas, hydro-electricity, fuelwood and vegetal wastes. The area's energy requirements amounted to 125,000,000 tons of standard coal equivalent in 1954. Thirty per cent of this amount was derived from fuelwood, charcoal and vegetable residues such as sawdust, bagasse and similar wastes. Statistical data on vegetal fuels, subsequent to 1954, are incomplete and are largely based on estimates. Consequently they are not as realistic as those for petroleum, coal and electricity.

Fuelwood and charcoal are used by the railways and other industrial activities and sawdust and bagasse are widely utilized in operations of which they are by-products. They represent items of trade just as much as do the oil, coal and electricity which would have to be purchased to replace them and are, strictly speaking, commercial forms of energy. However, their use as fuels is considered to be "marginal to the market" and the total volume of energy derived from these sources, which has remained relatively constant since 1937, is expected to decrease, rather than increase, in the future. Because of these conditions, wood and its products and vegetal wastes are not, for the purposes of this discussion, included in the category of "commercial" forms of energy.

In the commercial fuel economy of Latin America, coal plays only a minor role. Consumption of energy in the form of solid fuels (coal, coke and briquettes), liquid fuels (petroleum and petroleum derivatives), natural gas and hydro-electricity, approximated 123,000,000 tonnes, SCE, in 1959. Coal supplied about 11,000,000 tons, or slightly less than 9 per cent of the total. In terms of production, the area's output of these forms of energy amounted to 277,000,000 tons, of which 248,000,000 tons were derived from crude petroleum, 16,000,000 tons from natural gas, 4,000,000 tons from hydro-electricity and only 9,000,000 tons (or about 3.75 per cent) from coal.

Energy Pattern

On balance, Latin America produces considerably more energy than it consumes. It holds a position of major importance as a net exporter of energy in the form of oil and oil products. At the same time it is a net importer of coal, coke and briquettes. The seeming anomaly of this situation is placed in proper perspective when due consideration is given to the geographic location of the coal and petroleum deposits and their proximity to the energy consuming markets.

Three of the countries of Latin America which have some of the most extensive deposits of the better qualities of coal, Mexico, Colombia and Venezuela, also have the largest reserves of petroleum. The oil is of excellent quality. It is being produced at well-heads in more than sufficient quantities to meet the demands of area and world markets. These oil producing countries have seaports on the Caribbean which enables them to ship this bulk commodity conveniently and economically. The assured availability of almost

unlimited supplies of oil and oil products at prices which are extremely attractive in comparison to the less accessible and more expensive coal, has been a potent factor in the orientation of Latin America in general, and the oil producing countries in particular, toward an energy economy based on petroleum rather than on coal.

The following table shows the extent and location of the reserves of petroleum, natural gas and coal which may be considered to have economic significance for Latin America. The data have been derived from various sources and, while the source material is not strictly comparable, neither in terminology nor in degree of thoroughness, the figures listed are believed to be extremely conservative.

Country Location	Crude Petroleum '000,000 cu. m.*	Natural Gas '000,000 cu. m.	Mineral Coal '000,000 tonnes
Argentina ..	65.0	13,800.0	270.0
Brazil ..	8.0	1,200.0	1,100.0
Chile ..	9.1	156,900.0	1,455.0
Colombia ..	91.0	—	12,500.0
Mexico ..	359.0	86,000.0	2,600.0
Peru ..	37.6	—	400.0
Venezuela ..	1,651.0	522,240.0	1,100.0

* 1 cu. m. equals approximately 0.903 tonne.

It appears that the use of coal as a source of primary energy is on a much smaller scale than the extent of the coal deposits would seem to justify. Commercial coal production is limited to only a few countries and the coal industry of Latin America is, in general, in an elementary state.

Restricted Use of Coal

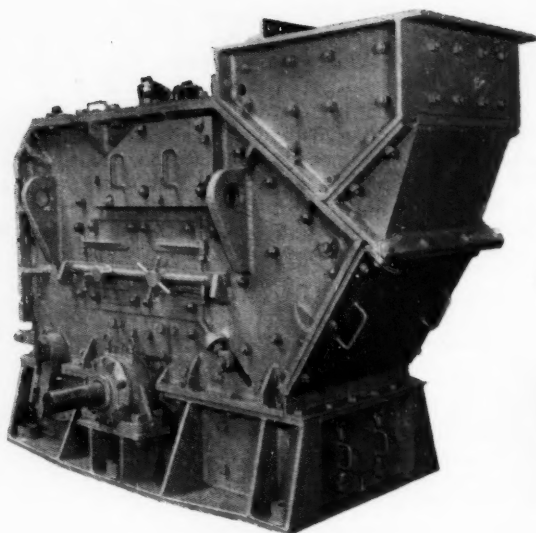
There are many factors which tend to restrict the more widespread exploitation and utilization of indigenous coal resources. The demand for coal is limited. Where coal is an essential part of an industrial complex, such as in the iron and steel industry, the indigenous product is usually more costly and of a poorer quality than imported coal. Where substitute fuels can be utilized, alternative sources of energy such as oil and hydro-electricity are generally more easily obtained, more convenient to handle and less expensive on a calorific basis. Difficult mining conditions and the generally inferior quality of the coal of Latin America contributes to low productivity and adds to the expenses incidental to the preparation of the coal to make it suitable for commercial disposal. The coal deposits now being commercially exploited are usually far removed from potential markets. There is an inadequacy of railroad transport, tidewater and bulk handling facilities which severely limit the further expansion of the coal markets and the coal mining industry.

The ready availability of petroleum and petroleum products at comparatively low prices, the relative ease and economy of transporting this fuel via water carriers, the convenience of handling and the flexibility in utilization, are some of the reasons the energy economy of Latin America, and particularly that part which has access to the Caribbean, has been orientated toward oil rather than toward coal.

The Latin American countries which do not border on the Caribbean are less fortunate in the extent of their coal reserves. These countries constitute the major portion of the land mass of the continent of South America. Efforts are being made to develop and expand their national economies, and the creation of iron and steel industries is an integral part of most of their economic plans. Coal and coal pro-

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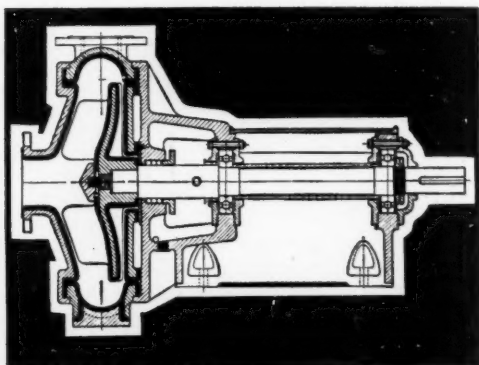
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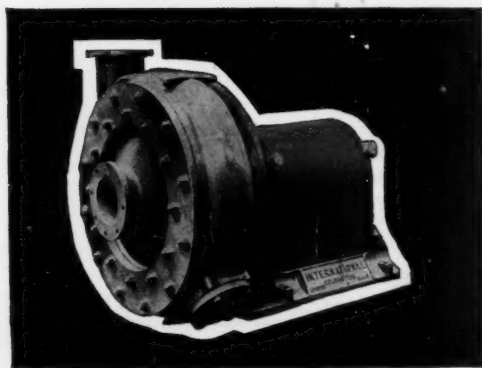
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ducts (coke in particular) are essential raw materials in these developments. Political and social as well as economic considerations exert pressures which will tend to shape the future energy supply pattern of these countries. It appears almost certain that Latin America's indigenous production of coal will increase substantially over the next five years (through 1965), although the percentage of the gross energy consumption requirement derived from coal and coke will probably remain almost static. The Economic Commission for Latin America has compiled the following data on mineral coal and coke utilization for 1954 and their projection of the area's 1965 requirements. The table below shows consumption, production and imports of mineral coal and coke, 1954, and projection of gross requirements, production and imports, 1965, in thousands of tonnes.

Country	Total Consumption		From National Production		From Imports	
	1954	1965	1954	1965	1954	1965
Argentina	1,678	2,800	107	900	1,571	1,900
Brazil	2,247	4,770	1,439	3,400	808	1,370
Chile	2,501	3,270	2,267	3,000	234	270
Colombia	1,500	3,000	1,500	3,000	—	—
Mexico	1,366	2,000	1,314	2,000	52	—
Sub total	9,292	15,840	6,627	12,300	2,665	3,540
Other	324	795	190	600	134	195
Total Latin America	9,616	16,635	6,817	12,900	2,799	3,735

The relative importance of the various conventional forms of energy in the economy in 1954 and the projection for 1965 is indicated in the following table from the same source.

Breakdown of Gross Consumption of Energy, Latin America, in percentage.

Country	Petroleum and Natural Gas		Mineral Coal and Coke		Hydro-Electricity		Vegetable Fuels	
	1954	1965	1954	1965	1954	1965	1954	1965
Argentina	72.0	80.1	7.9	7.3	1.0	3.9	19.1	8.7
Brazil	32.4	47.1	5.6	6.3	17.1	22.6	44.9	24.0
Chile	32.7	44.1	33.3	26.4	17.3	19.9	16.7	9.6
Colombia	37.0	42.7	18.8	23.3	11.3	19.9	32.9	14.1
Mexico	77.1	81.5	5.3	5.3	8.8	8.5	8.8	4.7
Others	67.2	76.5	1.3	1.9	5.3	4.8	26.2	16.8
Total Latin America	53.8	64.0	7.1	7.2	9.5	12.4	29.6	16.4

The official production data for the years 1958 and 1959 and the estimate of output for the year 1960, based on the latest available official publications, indicate the moderate increase in the use of coal in the energy economy, as forecast by the Economic Commission for Latin America, is materializing.

From these data the increase in coal consumption, in terms of raw tonnage, is clearly evident.

New Cage Raising Method in Australia

A METHOD of cage raising which eliminates the need for timber and reduces the time spent in travelling and hauling gear has been adopted by the Zinc Corporation Ltd. and New Broken Hill Consolidated Ltd. of Australia.

A cage consisting of two steel decks, 4 ft. in dia. and 7 ft. apart is hoisted by a steel cable connected to a hoist on the level above through a 3½ in. dia. borehole down the centre of the rise. The 7.5 h.p. piston type hoist used must be driven up and down; in the event of brake or air failure it descends slowly under its own weight.

The lower deck provides a storage compartment for the gear and is fitted with hatchway for entrance from below or to allow the escape of rock which has been barred down from above. A ladder connects the lower with the upper deck which forms the drilling platform. Skids are fitted to the underside of the cage when it is working in inclined rises.

When drilling is in progress three telescopic arms pin the cage to the sides of the rise. Outer rise holes are drilled from a swivel arm rotating immediately below the cage rope connections. After blasting, a brass weight is lowered through the centre borehole to check for blockages and a hose dropped to spray the back of the rise with a compressed air and water mixture through a special sprinkler head.

The method of cage raising adopted by the Zinc Corporation Ltd. and New Broken Hill Consolidated Ltd. of Australia



Two hoisting ropes, a ½ in. dia. bucket rope and ¾ in. dia. cage rope, and the knocker line are then lowered to the level below a small exhaust fan coupled to the top of the borehole to aid ventilation. On this lower level the cage rope is attached to the cage, lying on its side adjacent to the rise and hauled into a vertical position by the hoist.

A miner then travels in the lower deck to the face and bars down loose rock through slots in the upper deck. He then climbs on to the upper deck and bars down back and walls in the normal manner. Afterwards the rise is made safe and the cage is lowered to pick up a second miner.

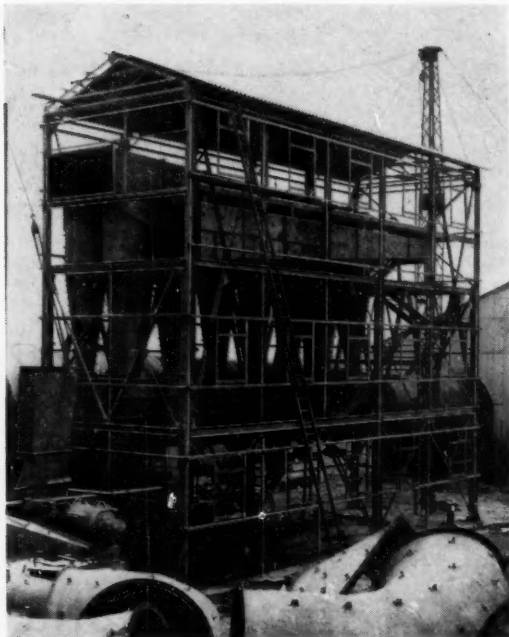
When the cage is back in position and supported by its telescopic arms the face is drilled out with Holman Silver Three Autostopers fitted with 7/8 in. hexagon tungsten carbide tipped steels. While the cage is pinned to the rise walls a 1½ cu. ft. capacity bucket attached to the ½ in. rope is used for travelling to and from the lower level.

Lead wires to the electric ½ sec. detonators used are taken down the side of the rise to prevent disturbance from the ropes when they are hoisted from the borehole, prior to firing, and the cage removed to one side of the rise.

Under local conditions which require two men to each rock drill an 8 ft. end can be pulled every two shifts—approximately ten hours' working time.

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Crawler Mounted Reichdrill

A crawler mounted, self propelled drilling rig which has been developed for a wide range of drilling duties has been introduced by the Reichdrill Division of the Consolidated Pneumatic Tool Co. Ltd. This drill utilizes a hydraulically operated variable speed drill rotation motor and a variable hydraulic thrust mechanism for use with either an in-the-hole hammer for blast holes of 4½ in. dia. or a rotary bit for holes of 2½ in. dia. in hard formations and up to 6½ in. dia. in soft rocks and alluvium. Thus in addition to general blast hole work, the drill is suitable for specialized work such as deep drilling for grouting or for anchorages in hardrock or concrete in addition to prospecting in alluvium and for well boring when used in conjunction with a 6 in. diameter casing.

The drill is powered by a Ford Dextra three cylinder diesel engine which develops 25 b.h.p. at 1,450 r.p.m. Alternatively a Sutton Power Pack may be fitted. The output from the engine is to a Triple Deri-Syne Hydraulic pump through a Renold chain coupling, these pumps operating in parallel and giving a system pressure of 1,750 p.s.i., for the operation of the mast positioning cylinders, drill rotation motor and self propelling mechanism. A CP. 365-RO-2 rotary Power Vane compressor is towed behind the drill to provide air power for the in-the-hole hammer and for air flushing.

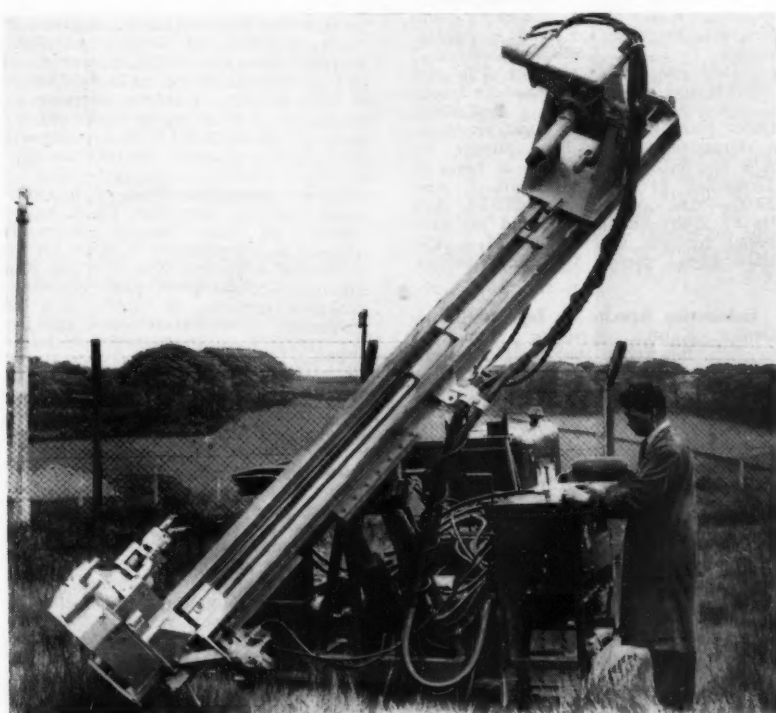
The drill frame is carried on two Bristol crawler tracks which have 10 in.

pads at 5 ft. centres, the overall length of the tracks being 8 ft. 3 in. A mast carrier bracket is welded to the leading end of the drill frame, this bracket carrying a swivel plate in which the drilling mast is held. This swivel plate which is operated by a double acting hydraulic cylinder of 4 in. bore, the piston having a stroke of 11 in., swings the mast through a maximum of 160 deg. Carried through the bracket is a further ram of 4 in. bore and 16 in. stroke which raises the mast from the retracted travelling position. The mast is of channel construction, having bar slides to carry a hydraulic rotary head mechanism and in addition having a fixed drill table at its base.

A feature of the drill is the block and tackle principle used for the thrust mechanism in which a hydraulic cylinder and piston, with a working stroke of 5 ft. 6 in. is used in conjunction with a pulley system having a velocity ratio of 2. This gives an effective working stroke of 11 ft. and can be operated at up to 40 ft. per min. for quick removal of drill stems.

The high torque conditions obtainable with this drill have led to the 10 ft. length hollow drill stems being fitted with screw joints of special alloy steel. For pressure drilling, a 50 r.p.m. rotary head motor is employed with in-the-hole hammers for holes of between 4½ in. and 5 in. dia. For use with A size diamond drill rods a 150 r.p.m. head is fitted for rotary drilling of holes of 2½ in. dia.

The Consolidated C155 Reichdrill



NEW COAL CONVEYOR

Ensign Conveyor Co. Ltd., which forms the Materials Handling Division of Thos. W. Ward Ltd., has now added to its range a new mobile electrically operated coal conveyor, and named the Ensign Dreadnought. The new machine handles coal up to 8 in. size, and stock-piles up to 20 ft. high.

The 36 ft. long boom, between pulley centres, is constructed of securely braced and welded R.H.S. The undercarriage is fitted with hydraulic jacks and pneumatic wheels, and can be adjusted to any height between the maximum and minimum. A squirrel cage drive is fitted, with totally enclosed geared motorized head pulley, for operation on standard a.c. supply.

The 24 in. wide belt is made of rubber and canvas, and is equipped with 1 in. high retarding cleats at 2 ft. pitch. The feedboot is made of mild steel plate, 8 ft. 6 in. high with hinged back flap, for feed by tipping lorry at control rate.

POLISH METHOD OF FIGHTING MINE FIRES

In the search for the most effective fire fighting agent, a solution of silicates (waterglass) was tested on burning coal, mine timber and rubber belting in a Polish experimental mine, according to a report in the technical Press. These tests demonstrated that at temperatures above 170 deg. C. this solution when sprayed over the surface of the burning materials, covered the latter with a protective layer of foam of a solid, lasting consistency thus insulating the material from a supply of oxygen and stopping any further combustion. On the other hand, at lower temperatures the surface of the materials which had not yet caught fire became coated with a vitreous permanent glazing which prevented the fire from spreading.

When fires are extinguished with this agent, no water vapour is generated, which might reduce visibility and add to the quantity of gases. A solution of silicates is therefore considered by the Polish research team to be more effective than any other extinguisher, especially for dealing with fires which have spread over a wider area. It cannot, however, be used for fires near electrical apparatus, because it conducts electricity.

NEW REFRACTORY MATERIAL

Two new refractories consisting of an expanded perlite base with ceramic bond and named Rioporit, have been developed in Hungary. One type can be used advantageously at 900 deg. C., while the other will withstand even as much as 1,350 deg. C. Both varieties have a heat-insulating property highly superior to similar Hungarian and foreign refractories. At the same time, manufacture is reported as cheaper, while strength—despite inferior gravimetric density—is much higher than that of any similar refractory material. The fact that perlite and other materials needed for the production of Rioporit are available in Hungary in a practically unlimited quantity, is particularly favourable from the Hungarian producer's viewpoint. Owing to its low gravimetric density, the finished product is claimed to be more economical than any similar material, as an equal grade of effective insulation can be obtained with a thinner layer.

MINING MISCELLANY

U.S. Interest in Madagascar.—Following reports of important mineral finds on Madagascar (see *The Mining Journal*, Dec. 1) it is now announced that the U.S. Westinghouse concern is interested in the development of a metal industry on the island, and the construction of power stations based on the Sakoa coal reserves in south-eastern Madagascar.

Japanese Smelter in Malaya.—The Ishihara Sangyo Industrial Co. has applied for the Japanese government's authorization plan to establish a tin refinery at Port Swettenham, on the west coast of Malaya. The plant, which would have an initial capacity of 50 tons of refined tin per month is planned for a monthly capacity of 1,000 tons by 1963. The plant, is estimated to cost M\$3,853,000, with Ishihara investing M\$2,488,000 and Malayan interests M\$1,427,000.

Canadian Nickel Production.—Canada produced 385,000,000 lb. of nickel in 1960, out of a total world production of 515,000,000 lb. Most of the Canadian output was exported, the U.S. being the chief buyer with a consumption of 1.25 lb. per capita, compared with per capita consumption of 0.5 lb. in Britain, Western Europe and Canada. Russian demand is slightly higher at 0.6 lb.

Bolivian Antimony.—It is understood that the Czech representatives of Technoexport, who have visited Bolivia recently, have proposed the installation of antimony smelting ovens in Oruro, and talks are already in progress on the project. Bolivia exported 4,484,769 fine kilos of antimony in the first eight months of 1961.

French Help for Greek Steel.—The French Institute of Geological and Mining Research, in co-operation with the Industrial Development Corporation and the Greek Institute of Geology and Sub-Surface Research, will conduct exploration work on the island of Thassos to assess the possibility of low-cost production of iron ores. It will also study the question of enriching the ores, and further processing by the Greek steel and iron industries, which are to be established. It is hoped that two drilling rigs will be set up on the island by the French Institute, and that operations will commence early in 1962.

Less Coal from ECSC.—The European Coal and Steel Community has announced that area coal output over the first quarter of 1962 will be some 59,000,000 tonnes, or about 800,000 tonnes less than for the corresponding period in 1961, had there been no compulsory "rest shifts". The figure of 59,000,000 represents a drop in production of 2.5 per cent, taking into account the lost output due to the Belgian miners' strikes in early 1961. No "rest shifts" are planned for the coming quarter. Coal imports into the ECSC are expected to total some 5,700,000 tonnes for the coming quarter, or 1,500,000 tonnes more than for the first quarter of 1961, the rising import trend being expected for all member countries. Exports to non-ECSC countries are expected to continue at present level. Pithead stocks by end March 1962 are estimated at 26,600,000 tonnes.

Improved Sulphide Ore Refining.—Research workers at the Michigan College of Mining and Technology have announced a new process for refining ore, which is claimed to increase the amount of copper extractable from low-grade sulphide ore. It is being applied to tailings left from present extraction methods. There are indications, it was further stated, that the process might be applied to the mining of nickel and cobalt. The research was financed by White Pine Copper Co., a subsidiary of the Copper Range Co. A pilot plant is scheduled to begin operations by January 1 and, if the experiment is successful, full-scale operation of the new process will be started late in 1963. A patent has been applied for.

Concrete from Mine Dump Sand.—A factory is to be erected near Brakpan, at a cost of R1,000,000 by a Johannesburg company, Siporex (S.A.) to use mine dump sand for the manufacture of a new light-weight concrete. This concrete is reputed to be one fifth lighter and one third cheaper than ordinary cement.

Funds for Tanganyikan Exploration.—Tanganyika is planning a prospecting programme, which includes expenditure of £125,000 on mineral exploration, £147,000 on geological photography and £170,000 on land surveys in its Three-Year Plan to strengthen the country's economy.

Norwegian Ferro-Silicon Output.—The Norwegian Ferro-Silicon Producers' Association announce that 1961 output is expected to be 175,000 tonnes of 45 per cent base alloy, compared with 170,000 tonnes in 1960. The Association, which acts for all seven Norwegian producers, state that about 96.5 per cent of the 1961 output will be exported, mainly to the U.K., West Germany and Belgium. Estimate for 1962 is 200,000 tonnes, for 1964, 250,000 tonnes and for 1965 over 300,000 tonnes. The new 200,000 tons per annum plant at Troms is expected to be opening in April next. Other plans include the construction of a large-scale ferro-silicon furnace by A/S Bjolvefossen, expansion of plant at Trondelag by A/S Hafsund, a new 20,000-tonne plant by 1963 by A/S Ila og Illeby Smeltverker, and the proposed erection at Nordland of a new ferro-alloys plant by Elektrokemisk A/S.

Indonesian Bauxite for Japan.—Showa Denko Kaisha, Japanese aluminium smelters, has stated that three Japanese aluminium refineries had jointly signed a long term contract with Indonesia for the import of 1,200,000 tons of bauxite from Bintan Island between 1962 and 1965. First shipment of 230,000 tons would be made in 1962. A further 200,000 tons of bauxite from Bintan is contracted for during the current year, in addition to the 400,000 tons bought during 1961.

Bolivian Tin Output.—Tin production by the Empresa Minera Unificada del Cerro de Potosi is reported to have shown an increase of 30 per cent this year over the 1960 figure. The mines, which are nationalized, are situated in the district of Cerro Rico at Potosi and are currently producing fine tin at the rate of 100 tons a month.

Spain's Nuclear Energy Programme.—Permission is being sought by Centrales Nucleares for the building of a 250,000 kW. nuclear power station in Librilla, Seville. The station, to be called Sevilla-Guadalquivir, is estimated to cost 3,228,800,000 pesetas.

Gas in Argentina.—Argentina's reserves of natural gas have been estimated at 216,000,000,000 cu. metres, and may possibly amount to 296,000,000,000 cu. m. Under present circumstances, gas produced during petroleum extraction has been increasing faster than consumption, and so is wasted but Gas del Estado plans to transport 20,000,000 cu. m. of gas daily in 1967-68, and 25,000,000 cu. m. by 1970.

Belgian Coal Subsidies.—The High Authority of the ECSC has approved Belgium's policy of progressively reducing subsidies to her coal mines. The Belgian government is to pay subsidies totalling some 250,000,000 francs to coal mining companies in difficulties in 1962, compared with a total of 400,000,000 frs. for 1961. The government is also pledged to try to reduce the subsidies still further.

Russian Opencast Mining.—The present annual output of coal by opencast mining in the Soviet Union is estimated at about 105,000,000 tons, which will be increased to about 142,000,000 tons by the end of the Seven-Year Plan, in 1965.

Non-Metallic Minerals in Bulgaria.—Pegmatite, used in the production of feldspar concentrate for the porcelain industry, is found in large reserves on the river Bistrichka, and a rich deposit is already being exploited at Dolno Ossenov, in the district of Blagoevgrad. These deposits should cover Bulgaria's domestic requirements, and may provide some surplus for export. Disthene, used in the production of refractory materials, is present in large deposits in the country, and also diatomite, which has been located near Varna. This is being used in the production of cement at Reka Devnya. Bentonite is found in Varna and in Dimitrovgrad, as well as in the districts of Tolbukhin and Kurdjali, where seams range from 5 to 20 metres thick, and are close to the surface. Bentonite deposits are estimated at over 1,000,000 tons.

Mysore Aluminium Plant.—It is understood that the aluminium plant, to be known as the Bharat Reynolds Aluminium Corporation, is to be set up at Dandeli in Mysore State. The licensing committee of the government has sanctioned a capacity of 30,000 tons of aluminium ingots, 60,000 tons of alumina and 15,000 tons of aluminium fabrications for the plant, according to a report in the *Eastern Metals Review*. Provision is to be made for subsequent expansion of the plant's capacity to 90,000 tons a year.

BSI Safety Valve Application.—The British Standards Institution has revised and enlarged B.S.1123, giving specifications for safety valves, gauges and other safety fittings for air receivers and compressed air installations. Although the main provisions of the standard remain unchanged, an important modification is the permissible use of safety valves having an established discharge greater than provided for by the minimum aggregate area formula. The revision also includes a comprehensive specification covering the requirements for safety valve springs.

Metals and Minerals

Large Stocks Still Depress Manganese Markets

So far as the present position of the world market for manganese ore is concerned, Major A. C. Herring had little encouragement to offer shareholders of Central Provinces Manganese Ore Co. Ltd., in his annual statement. The volume of the company's sales in 1961 looks like amounting to a figure similar to that of 1960, but there has again been a decrease in the margin of profit and it is expected that the result for 1961 will show a further reduction.

A good deal has been written about the recovery in the United States, said Mr. Herring, but so far this has not resulted in an increased demand for the company's manganese ore. Among the reasons for this are the very large stocks of ore still held in that country and the supplies which America is now receiving from new properties recently brought into production and in which U.S. companies are financially interested. In this context it may be noted that last year the U.S. imported a total of 2,543,576 s.tons of manganese ore, of which 874,808 tons came from Brazil and 479,279 tons came from India. At the end of last year U.S. stocks of manganese ore amounted to no less than 2,587,536 s.tons; by the end of August this year they had been reduced to 2,316,543.

In contrast, to the depressed condition of export markets is the growing demand for manganese ore which has risen within India herself. Whereas in the past the company's sales of ore for consumption in India have been negligible, it is noteworthy that they reached a substantial level in 1960 and further advanced in 1961. This is due to the fact that India now has several ferro-manganese plants in operation. India's ambitious programme of steel works' expansion will, of course, involve a corresponding expansion of the facilities for ferro-manganese production. A growing domestic market for manganese ore will thus be assured for many years to come.

Major Herring's comments on the new Rupee company are discussed on page 661.

PLATINUM-GROUP METALS IN THE THIRD QUARTER

The American industries used 198,000 oz. of platinum-group metals in the third quarter of this year. This showed virtually no change in industrial consumption over the preceding quarter but was 32 per cent more than in the third quarter of 1960, according to data compiled by the U.S. Bureau of Mines.

Sales of platinum-group metals for the first nine months of 1961 totalled 575,000 oz., slightly less than in the corresponding period of last year. Net imports of platinum-group metals at 293,100 oz. were 21 per cent greater than for the preceding quarter and nearly three times more than net imports in the comparable period of 1960, while during the first nine months of this year net imports of these metals totalled 678,200 oz. against 503,400 oz.

Platinum sales in the third quarter dropped 6 per cent below those of the

second quarter. A sharp rise in sales to the petroleum industry and slight gains in sales for jewellery and miscellaneous purposes were not sufficient to offset a decline in the quantity of metal sold to other consuming industries. Palladium sales increased 4 per cent in the quarter as increased demand from the chemical industry more than offset a drop in demand from electrical industries. Aggregate sales of minor platinum-group metals, iridium, osmium, rhodium, and ruthenium (7,600 oz.) increased 7 per cent over those of the second quarter.

Refinery production of platinum-group metals (new and secondary) in the third quarter dropped 17 per cent to 32,800 oz.; working stocks of these metals reported by refiners and dealers declined 6 per cent. Platinum refining (new and secondary) was down 14 per cent, and imports of refined platinum (100,800 oz.) were 94 per cent greater than in the second quarter. Working stocks of platinum reported by refiners and dealers showed a 2 per cent gain.

Palladium refining (new and secondary) decreased 15 per cent, but imports of refined palladium rose 10 per cent. Refiners and dealers working stocks dropped 13 per cent during the period.

Refinery output of iridium, osmium, rhodium, and ruthenium together (708 oz.) decreased 67 per cent in the quarter. Imports of these metals decreased 37 per cent; and stocks declined 2 per cent.

★

Rustenburg Platinum Mines in their report for the year end August 31, 1961 point out that there has been no change in the official price of £30 5s. an ounce since the close of their financial year. As a result of the accumulation of adequate stocks of the metal a reduction in operations has been effected to stabilize production at a level appropriate to normal market requirements.

In recent months there has been little activity in the U.K. free platinum market and the price has remained unchanged at from £27 7s. 6d. to £27 17s. 6d. per ounce. On the re-export market, however, rather more general interest has been shown recently than for some time past.

U.S. AND U.K. SILVER PRICES RISE

The U.S. silver selling price advanced to 105 cents at the end of last week. Handy and Harman, apparently unable to find adequate offerings at the previous price, increased their "official" quotation of 104½ per fine ounce, an increase of 1½ cents to make the New York selling price 105 cents, the highest for about 41 years. At this new peak level, the domestic volume was once again ap-

proaching 500,000 ounces, according to trade estimates.

Largely as a result of this sharp rise in the New York price the spot price of silver in the London market was increased by 1½d. to 88½d. and the forward price by ½d. to 89½d.

★

The Bureau of Mines stated this week that U.S. output of recoverable silver, reversing a four-year decline, has risen about 12 per cent in 1961 to 34,455,463 troy ounces. The Bureau's estimate, based on preliminary data, said production of silver in 1960 amounted to 30,766,327 ounces.

The gain in silver output was attributed principally to relatively stable operations at major silver-producing mines in Idaho during most of the year following settlement of labour strikes late last year. Imports of silver declined sharply for the fourth successive year as U.S. consumers continued to purchase most of their silver from U.S. treasury stocks. Exports increased for the third successive year.

Incomplete production data indicate that world output of silver was slightly higher than last year with most of the principal silver-producing countries again recording gains, the report stated, although it gave no statistics. Both domestic and free world consumption of silver also increased.

U.K. WOLFRAM ORE MARKET

The price of wolfram ore has continued to harden with dealers generally quoting a range of from 93s. to 100s. per long ton unit c.i.f. Europe compared with 90s. to 93s. previously.

Quite large business is understood to have been done, with the U.K. and the Continent again the chief participants. Business is believed to have been done at the top end of the range.

TANTALUM PRICES INCREASED IN U.S.

Fansteel Metallurgical Corporation has increased prices of tantalum products 10 to 20 per cent to meet higher raw material costs Mr. Ralph W. Rawson, Chemical and Metallurgical Division Manager has stated. Other companies said they are studying the price situation.

Ore prices had doubled over the past 12 months and represented a very high percentage of the total costs of these tantalum products, said Mr. Rawson. These increases in materials costs could not be overcome through manufacturing efficiencies and would have to be passed on.

MANGANESE ORE TRADING QUIET

There has been no material change in the manganese ore market, according to trade quarters. World demand, still shows no signs of broadening and with supplies plentiful, prices are unlikely to move away from the depressed levels which have now persisted for a long time.

Owing to the Christmas holidays, our regular market features do not appear this week. They will be resumed in our next issue

For 46/48 per cent ore a price of 66d. to 68d. per long ton unit c.i.f. Europe continues to be indicated.

Among consuming countries it is understood that the U.K. has not yet made any definite moves towards covering next year's anticipated requirements. Steel production is below last year's and most consumers are not optimistic regarding a revival in demand for ore for the time being. Moreover, very big stocks of ore are held by the U.K., which places her in a good bargaining position. Japan has remained the most consistent buyer with quite large tonnages being taken and, according to some reports, purchases not being greatly affected since the Japanese Government introduced new measures to reduce imports of certain commodities which included manganese ore.

U.K. imports of ore from all sources in October totalled 29,804 tons, lifting the quantity for the January/October period to 403,364 tons, according to Board of Trade statistics. In the same period of 1960, a total of 404,800 tons arrived. The Soviet Union remains the largest supplier with a tonnage of 117,241 tons against 119,457 tons last year.

COMMUNIST HEADACHES AT MOA BAY

According to an official of Freeport Sulphur, reports emanating from Cuba indicate that Russian, Czechoslovakian and Chinese technicians are encountering considerable difficulties in operating the Moa Bay nickel and cobalt refinery which, contrary to recent reports, has not yet gone on stream. Major sources of

trouble are believed to be corrosion of equipment by the slurry produced in the new chemical process and also handling of the slurry, which was designed for shipment to Freeport's refinery in Louisiana. It is also believed that the foreign technicians are not too familiar with titanium metal, which was extensively used in the construction of chemical apparatus. The plant has a designed capacity of about 20,000 s.tons of nickel and 2,200 s.tons of cobalt a year.

The Russians have apparently been successful, however, in operating the Nicaro nickel plant, owned by the U.S. Government, which has a capacity of 26,000 s.tons of nickel oxide per year. They are talking of building a third nickel plant in the hope of raising the Cuban production to 50,000 t.p.a.

NORWEGIAN MANGANESE

Norway imported about 151,500 tons of manganese ore in the period January-August this year, compared with about 198,000 tons in the first eight months of 1960. British Guiana was the biggest supplier, followed by the U.S.S.R., and Ghana.

QUEBEC COLUMBIUM

Quebec Columbium, a subsidiary of Kennecott and the Molybdenum Corp. of America, has completed exploration work on its property at Oka, about 40 miles west of Montreal, Quebec, reports *The Northern Miner*. The property is to be placed on a care and maintenance basis at the end of the year and the economics

of production will be re-evaluated if and when market conditions improve.

NEW TUNGSTEN CARBIDE DEVELOPED

Development of an ultra-strong tungsten carbide capable of sustaining pressures of more than 1,000,000 lbs per square inch has been announced by Kennametal, Inc. The company said it is using its new carbide to make anvils, dies, plungers, and backup plates which are used in the synthesis of diamonds, borazon, and other hard materials.

RECORD WORLD STEEL OUTPUT

In the first nine months of 1961 world steel production reached the record total of 276,000,000 s.tons, according to the U.S. Department of Commerce. In the corresponding period of last year it amounted to 274,000,000 tons—also a record. Japan, with an increase of 5,000,000 tons or 27 per cent, displaced the U.K. as the fourth largest steel producer. Output in the U.S.S.R. continued its upward trend, rising by some 4,500,000 tons or eight per cent. The European Coal and Steel Community as a whole recorded a gain of 2 per cent; of the individual Community countries Italy had the highest rate of increase—some 10.5 per cent. U.S. output on the other hand declined by 12.5 per cent and accounted for 26 per cent of the world total compared with 29 per cent in the first nine months of last year. There was also a fall of about 5 per cent (about 1,000,000 s.tons) in the U.K. production. The Department's figures exclude production in China and North Korea.

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Mining Finance

Gold Fields, Expansion and Diversification

Mining and industrial expansion may be measured in a number of ways but, whichever method is chosen and applied to the latest Gold Fields' results, the group is moving from strength to strength on its policy of expansion and diversification. The profits for the year, before taxation, have increased by almost £1,500,000 to £6,826,000, the market value of investments has increased from £41,695,670 to £42,378,219 and the total group assets have risen to approximately £58,000,000.

In his annual statement, published on page 663, Sir G. S. Harvie-Watt has given a geographical breakdown of these assets. Investments in Southern Africa represent 66 per cent, North America 10 per cent, and Australia 6 per cent, whilst the remaining 18 per cent is mainly accounted for in the United Kingdom. Of the total assets some 71 per cent is represented by gold mining, though there can be little doubt that the proportion of earnings due to gold mining is rather higher.

Whilst no specific figure is given, the substantial increase in profits, mentioned above, is due in no small measure to the increased profits of the gold mines within the Gold Fields group, particularly West Driefontein. The increase in profits is also partly due to the enlargement of the group. Looking to the current year, the chairman has said that the indications are that the profits will be somewhat lower though it should still be possible to maintain the present rate of dividend on the proposed increased capital.

This reduction in profits will be a function of four main factors. It is unlikely that the profit from the realisation of investments will be maintained at last year's level, for the 1960/61 figure included £335,000 from the sale of the group's holding in Apex (Trinidad) to British Petroleum. Secondly, the profits from Alumasc in 1960/61 were influenced by the peak demand from breweries for aluminium casks and ancillary equipment. Whilst the long term outlook remains promising the profits for the current year seem unlikely to attain last year's level. Another factor in the group's overall profit picture is the generally lower base metal prices which are now ruling and, finally, it is anticipated that the taxation charge will be higher; in 1960/61 certain favourable adjustments arose.

Turning to the group's diversification programme Gold Fields have been particularly active during the past year in Australia. Together with American companies, a considerably increased exploration programme has been instituted and the exploration company, New Consolidated Gold Fields (Australasia), is investigating iron ore deposits in north-western regions of Western Australia and a large number of base metal prospects elsewhere in the country. A particular feature of the Gold Fields work in Australia has been the development into rutile. A majority holding has been acquired in Associated Minerals Consolidated, the rutile and zircon producer, and in turn this company has acquired a majority interest in Z.R. Holdings. Earlier this year the rutile market remained in the doldrums and prices as low as £20 per ton were offered, but there has been a marked improvement recently and it is hoped that the new Du Pont chloride process will create not only its own demand but may also trigger-off

additional demands in other countries. Gold Fields themselves have expressed great confidence in the future of rutile.

In the United States the major development has been the decision by Tri-State Zinc to develop a zinc mine in the New Market area of Tennessee. It is hoped to commence milling in 1963.

The considerable expansion of the Gold Fields group has necessarily meant that much of the group's cash resources is earmarked for current or planned projects and if the company is to be in a position to take prompt advantage of any new business offered then it is essential that its cash resources should be strong. It has therefore been decided to make a further rights issue of one-for-ten in the new year. South African shareholders will be allowed to subscribe for these new shares but, as suggested here on November 24, the funds raised in the Republic must be used to meet capital expenditure in that country. The total amount to be raised by the issue is approximately £1,570,000; on the basis of the shareholdings it seems possible that about £235,000 will be retained in South Africa.

The current London price of Gold Fields is 68s. with a gross yield of 7.7 per cent.

C.P.M.O. AND THE INDIAN GOVERNMENT

In his annual statement, published on page 665, Major A. C. Herring has expanded the information given in the directors' report on the arrangements with the Indian Government.

Central Provinces is to retain its stocks of ore and these should result in a considerable amount of cash accruing to the company though the complete disposal of the stocks will take some years. In principle these stocks will be disposed of on a proportionate basis with the ore produced by the new rupee company. But it appears that a considerable portion will, in fact, be disposed of in the first year as the new company will not have had the opportunity of delivering to the ports the full amount of ore for a year's production.

This in turn must be reflected in the profits of the new company and Major Herring has pointed out that for the first year or two the new company's profits will be somewhat lower than what could be described as normal. Thereafter with a prosperous manganese ore industry and "full co-operation between the new company and the C.P.M.O." it should be possible for satisfactory profits to be made and in turn dividends paid to C.P.M.O. on its shareholding.

On the mines themselves operations continue to be very satisfactory. At the South Tirodi mine the opening up of the first level below the plain level has shown that the ore bodies continue to be of very good quality. The re-opening of Beldongri mine has progressed satisfactorily and it will shortly be ready for production.

TEETHING TROUBLES AT AYER HITAM

It is perhaps not surprising that Ayer Hitam's new No. 2 dredge, which is digging deeper than any other bucket dredge has attempted before in Malaya,

should be having teething troubles. The main problem has been that the angle of retention under the water-line has been insufficient for the depths at which the dredge is now working and tailings have been fouling the buckets at the digging point. In order to overcome this problem the tailings stacker boom is being extended and it is anticipated that this work will not entail much down-time.

Work on re-fitting the No. 1 dredge was completed well ahead of schedule and it went into production during the latter part of September. The unit has been converted to electric drive and the old palongs have been replaced by hydrocyclones and jigs. In his statement the chairman, Mr. G. W. Simms, has said that its operation is fully up to expectations and is a great improvement on previous performance.

Aokam Tin, in which Ayer Hitam has a substantial interest, at present operates a grab dredge off the west coast of Thailand; consideration is now being given to the installation of a sea-going bucket dredge. This would considerably improve the productive and earning capacity of the company. Consideration is also being given to the proposal to transfer the residence of the company from Malaya to the United Kingdom. However, as the Thailand government has a substantial interest in the company, it will first be necessary to gain its agreement in these matters.

FURTHER EXPANSION AT SUNGEI BESI

From the latest annual report and from Mr. Simms' statement there seems little doubt that the operation of the bucket-wheel excavator at Sungai Besi—the first in Malaya—is a success. Since January, the 50 litre excavator has worked at an average rate of 67,000 cubic yards per month and has, in fact, been limited to this yardage by the capacity of the treatment plant.

The operating cost of the unit seems high at 75.3d. per cubic yard treated (74.6 per cubic yard mined) but this will obviously be reduced when the plant is operating at full capacity for a whole year. Under such conditions it seems likely that the cost could be reduced to between 60d. and 65d. per cubic yard.

Quite obviously it is the success of the operations in the Sungai Besi section that has encouraged the directors to order a similar yet much larger unit for Hong Fatt. Work on expanding the treatment plant to handle the additional tonnage that will come from this new excavator is well under way and it is anticipated that it will be completed before the trial runs are complete. The new excavator is a 120 litre unit and will be delivered on site in March 1962, actual mining operations should start during the 1962/63 financial year.

Although in the first six months of the current year only 831 tons have been produced compared with 913 tons for the same period of the year under review, the future trend must be for a considerable expansion and the accounts for the current year should also reveal an improved profitability. This expansion is largely discounted in the current London share price of 43s. with a yield of 5.1 per cent.

LAMPA MINING

Although the chairman, Mr. G. L. Carroll sounded a note of caution in his statement last year Lampa has reduced its dividend payment only slightly, from £25,725 to £24,500. The lower profits were due to the drop in copper prices and the lower grade of ore. Looking to

the current year the chairman has sounded a note of cautious optimism based upon the extra output from the fourth furnace and the San Rafael flotation plant; this plant only commenced operations towards the end of the last financial year. In his statement, extracts from which are published on page 666, the chairman has made no reference to the metal prices in the current year, though the currently increasing price of silver must add to his optimism. About 33 per cent of the company's revenue is currently from the sale of silver.

From the technical standpoint the most disappointing aspect of the annual report is the closure of the segregation plant. This plant was started in December 1960 (see *The Mining Journal*, Oct. 28, 1960, p. 472) and although the technical problems have been largely overcome it has not proved to be a commercial proposition.

This disappointment has been offset to a degree by the improvements at the smelter. Due to improvements in throughput and efficiency it is now possible to treat at the smelter the very ores from the Berenguela mine which were intended for the segregation process. This improvement at the smelter has been helped considerably by the addition of the chalcopryite ores from San Rafael.

Operations at the Berenguela mine are being transferred to opencast at the Open Stope and operations in other parts of the mine are being closed down as circumstances permit. Eventually it is intended to restrict operations to the Open Stope. During the past year the preparations there have proceeded well and a large volume of overburden has been removed. Stopping of ore from the face has recently begun.

At San Rafael recent development has not been too encouraging and the work during the past year has only added sufficient to the ore reserves to balance current depletion. Work has started, however, to open up a vein which lies parallel to the main San Rafael vein. Driving is at present in progress on the eighth and ninth levels.

The current London yield on the Lampa shares at 7.6 per cent reflects the market optimism on the likely movements of the silver price.

MALAYAN TIN'S RESERVES

On the basis of the three dredges at present employed on the Kampong Gajah property, Mr. F. G. Charlesworth has estimated that the reserves have a full operating life of about 34 years. These are substantial reserves indeed and certainly warrant the serious consideration of an additional dredging unit.

This is a matter which has been before Malayan Tin for some while and in his address, published on page 664, the chairman has said that it is hoped to make a decision within the next few months. Operating four dredges continuously at Kampong Gajah the life would still be 22 years and with the reserves valued at 0.436 lbs. per cubic yard the amortization of a new unit, even at a cost of some £1,500,000, should not be difficult.

It has been suggested by the company that if it is decided to go ahead with the purchase of the new unit then the project would be financed partly from reserves and partly from a share issue. The market reaction to this news was to mark the shares down but, in fact, there should be little difficulty in raising the funds. Even if the public at large showed no great

interest then surely many of the other Malayan tin producers would be anxious to invest their "surplus" cash resources in this project.

At the Batu Gajah property it is anticipated that the No. 6 dredge will work out the remainder of the undredged ground before the end of the current year. It is then intended to make certain small improvements to the unit and to test dredge an area of 560 acres which, although dredged previously before 1942, has been shown by boring to contain reasonable values. If the testing is successful then it is intended to rework the whole area with the No. 6 dredge and also perhaps, after repairs and improvements, the No. 5 dredge. This area could provide a very useful additional income.

SOUTHERN MALAYAN GOING TO DEPTH

Last year the chairman disclosed that a boring programme had shown extensive areas of undredged ground below the digging depth of the currently operating dredges. The company's investigations have now shown that these areas can be profitably reworked and it is planned to modify the No. 5 dredge for the purpose. This unit will be closed down shortly and both its digging depth and capacity will be increased.

In order that at least five dredges should be operating continuously the plans to equip the Degong property with the No. 6 dredge will be postponed until the No. 5 dredge re-fit is complete. These projects will necessarily involve a heavy capital expenditure programme but the company's resources should be adequate.

As a result of the general increase in the market value of Eastern Tin shares the value of both Malayan and Southern Malayan's portfolios have increased by over £1,000,000, and the revenue to both companies under the item of dividends and interest has increased by over 220 per cent.

In the first five months of the current year Southern Malayan have produced 1,402 tons and Malayan 934 tons.

NO DOUBT ABOUT PAHANG'S LEASE

Recent criticism of the board's policy at Pahang has been based upon two points. Firstly, that in view of the world tin situation the mine should increase its output and secondly, that the cash resources are more than adequate and a capital repayment should be made to shareholders.

Answering these points, the chairman has reminded shareholders that in a lode mine it is essential that production should not run ahead of proved ore reserves and that even with the substantial increase in development footage to 14,856 feet this year the gain in the ore reserves was only marginal and certainly not sufficient to warrant an increased production rate. The technical adviser has commented that it is a struggle to maintain even the current production rate of 215 tons per month. These arguments are very plausible but they would be far more convincing to the dissatisfied shareholders if the actual ore reserves were published.

The most important point to arise, however, is the fact that the lease will be renewed when it expires in 1968. The previous uncertainty about the lease was undoubtedly one of the factors which encouraged the feeling that the mine should be worked at the highest rate possible. The actual terms of the lease are still under negotiation.

As at the date of the balance sheet, July 31, 1961, Pahang's net current assets amounted to £967,624 and since that date the buffer stock contributions have been received in full. No estimate of the cost of the capital expenditure programme has been given but the main item will certainly be the sinking of the Baker shaft. This shaft which is to be sunk from the No. 14 level will serve the mine down to the No. 20 level where diamond drill intersections have shown favourable indications. The other commitments are in connection with the possibilities of the Paloh Lode in Malaya and the Cligga area in Cornwall.

Without the company's estimates of the cost of the shaft sinking project it is not possible to judge whether the current cash resources of the company are excessive or not, though the cost of the shaft sinking together with the hoisting and air conditioning equipment does seem to be very well covered. Much must depend upon the developments at Paloh and Cligga but in the meantime the very high proportion of the company's assets in low yielding government stocks does seem open to question.

WITBANK COLLIERY

The directors' report and accounts for Witbank Colliery reveal that the company's profit has again been increased this year, albeit only marginally. However, as a result of the reduced level of capital expenditure it has been possible to increase the dividends from a total of 25 cents to 27 cents and to increase the balance carried forward from R755,426 to R938,520. It is anticipated that capital expenditure in the current year will amount to approximately R70,000.

During the year ended August 31, 1961 the total quantity of coal despatched from the colliery increased by 134,562 tons to 1,935,760 tons. This increase reflects the increase in output by the Wolvekrans section where there has been an improvement in working conditions on the No. 4 seam.

In this section, where the two mechanical units are operating, production was generally maintained at a satisfactory level though during the latter part of the year output was restricted by intermittent shortages of railway trucks.

GEOLOGISTS

(1) **MINE GEOLOGIST** required for a copper mine in Uganda. Duties include underground mapping, structure studies and general supervision of diamond drilling, development headings and stoping in a complicated orebody. Previous underground experience essential.

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CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA

The Annual General Meeting of The Consolidated Gold Fields of South Africa Ltd., was held on December 14 in London.

Sir George Harvie-Watt, Bt., T.D., Q.C., the chairman, in the course of his speech said:—

At June 30 this year the assets of the Group, taking Stock Exchange value for quoted investments, totalled approximately £58,000,000. Of this total 66 per cent was represented by interests in Southern Africa. North America accounted for 10 per cent and Australia 6 per cent. Most of the remaining 18 per cent was accounted for by interests in the United Kingdom.

Progress of Diversification

Although our dependence on gold mining is still considerable, there has been continued progress towards diversification within the mining sector of our assets. At June 30 last, gold mining accounted for 71 per cent of our quoted investments compared with 77 per cent at the end of the previous year. I must point out, however, that the reduction in the proportion of our investments attributable to gold was, to some extent, due to the fall in Stock Exchange prices of African gold mining shares.

Partly as a result of our acquisitions in 1959, we now have within the Group a number of industrial companies. These industrial interests in the United Kingdom, North America and South Africa, together made a substantial contribution to Group earnings amounting to £863,000 during the period under review. Our success in this field testifies to the advantages of diversification into spheres where our knowledge of metallurgical and other technical processes can be put to good use.

A Most Successful Result

Profits for the year, before taxation, amounted to £6,826,000—an increase of nearly £1,500,000 over the previous year. I feel sure you will agree that this is a most successful result. It is gratifying that the improvement of nearly £1,000,000 in dividends and interest on investments, was not solely attributable to the enlargement of the Group. It was assisted in no small measure by increased income from the investments which have been held over a period of years, in the new and still expanding South African gold mines, and in the platinum industry. Profits from the realisation of investments, which include profits of £335,000 arising from the sale of Group holdings in Apex (Trinidad) Oilfields Limited to British Petroleum Co. Limited, came to around the same total as last year. All the other income sectors show a substantial improvement.

Your Directors recommend the payment of a final dividend of 3/9d. per Ordinary Share, less tax, thus maintaining the previous year's total of 5/- per share, but on a capital enlarged by last year's one for ten capitalization issue. The Preference and Ordinary dividends will require £1,729,000, leaving £1,635,000 to be carried forward, an increase of £69,000 in the amount brought forward from 1960.

Uninterrupted Progress

Investments in the South African gold and platinum mines remain the major asset of the Group and its principal source of

income. In view of the disturbances which have occurred in parts of Africa during the past year, I am glad to report that progress by the South African mining industry has been uninterrupted. During this period, industrial relations have continued to be good, and the output of gold and the profits earned by the industry were both new records. Shareholders in the mining companies have received during the past year an increased reward by way of dividends on the substantial capital sums, approaching a total of £450,000,000, which have been invested in the South African gold mines since the war.

Our wholly-owned subsidiary, Gold Fields of South Africa, is responsible for administering the operations of the Group throughout the whole of Southern Africa, and it is gratifying that the results of our established producing mines have again been outstanding. Among many noteworthy features, West Driefontein achieved a new record working profit of £13,700,000; working profits having exceeded £1,000,000 in every month since February, 1960. New record working profits were also achieved by the Doornfontein, Libanon and Lui-paards Vlei companies.

Australian Interests

Since the end of the financial year, there have been further developments in our Australian interests which are of major importance.

Last October we were successful in acquiring a majority interest in Associated Minerals Consolidated, which produces rutile and zircon from extensive beach sand deposits on the eastern coast of Australia. Subsequently, Associated Minerals have extended and consolidated our interests in the Australian rutile industry. We have great confidence in the future of rutile, and there has been evidence in recent months of a marked increase in demand by industrial consumers.

We have greatly increased the scale of our exploration activities in Australia through the medium of New Consolidated Gold Fields (Australasia), which is also a wholly-owned subsidiary. This exploration company is investigating reservations containing deposits of iron ore in the north-western regions of Western Australia, as agent for Consolidated Gold Fields (Australia) together with Cyprus Mines Corporation and the Utah Construction & Mining Co. Elsewhere in Australia, the exploration company is investigating a large number of mineral occurrences, primarily of base metals, on behalf of Consolidated Gold Fields (Australia) and Cyprus Mines Corporation as equal partners. These ventures constitute a further expression of the partnership of British and American capital in pioneering new mining areas, and give us a wider opportunity for success in the field of exploration.

During the year the major development in our American activities was the decision by our Tri-State Zinc Company to exercise the option acquired from American Zinc, Lead and Smelting Company, to develop and bring to production a mine in the New Market area of Tennessee, where extensions of the zinc deposits which have been mined for many years have been discovered. Construction work is proceeding to schedule, to enable milling to commence in 1963.

As a step in the expansion of our interests in the United States, we have formed a new

company called Gold Fields American Corporation as a wholly-owned subsidiary of Gold Fields Mining & Industrial. Gold Fields American Corporation will take over the New York Office organisation and provide administrative and other services to the various interests of the Group within the United States.

We are also planning to extend our activities in Canada, and are now in process of forming a new Canadian mining finance company, with an issued capital of \$3,500,000. It is our intention immediately on the formation of this company to offer a substantial block of its shares to the Canadian public.

Two Important Aspects

The events of the past year have been significant to the Group in two major respects. Firstly, although the potential of our investments in South Africa is substantial, our investments have become increasingly overshadowed by political events in the African Continent. The market prices of African-based securities have suffered from a serious setback in the confidence of overseas investors, a confidence which was not helped by the restrictions on the free movement of capital out of that country.

The second main feature of our activities in the past year has been our many achievements in expanding and diversifying our interests in Australia and North America, and in developing our industrial ventures in the United Kingdom. This has provided us with a sound framework for further expansion. Our progress in this direction, will be governed by our success in finding new business which not only holds promise of profit, but which is also of a nature which can benefit from the resources available within the Group.

Rights Issue

It has been decided to raise further money for the parent company, which will be available to the Group as a whole, by a rights issue at the end of next month. The amount to be raised is approximately £1,570,000. Ordinary shareholders on the register at the close of business on January 12 and holders of Ordinary Share Warrants to Bearer will be entitled to subscribe for one new Ordinary Share for every ten Ordinary Shares held, at a price of 30/- per share.

The indications are at present that the operating results of the Group in the current financial year will justify the payment of dividends during 1962 on the increased capital at a rate not less than for the past financial year.

Further Expansion Envisaged

As shareholders are aware, the past year has been one of further expansion. We expect the current year to see that expansion continued, particularly with the setting up of our new companies in Canada and the United States. These plans for continued expansion are an important part of our overall objective, which is to build up for our shareholders a London based and controlled mining finance house through which they have the opportunity to participate simultaneously and on a large scale in new mining and allied industrial ventures in several of the most progressive countries in the world.

The Report was adopted.

SUNGEI BESI MINES AND AYER HITAM TIN DREDGING

The annual general meetings of Sungei Besi Mines, Ltd., and Ayer Hitam Tin Dredging, Ltd., were held on December 15 in London.

Mr. G. W. Simms, Chairman, presided.

The following are extracts from the Statements of the Chairman, circulated to shareholders:—

SUNGEI BESI MINES LTD.

The net profit for the year to March 31, 1961, is £239,856. Dividends totalling 1s. 6d. per share have been paid in respect of the year and a final dividend of 9d. per share is recommended leaving a balance of £113,410 to be carried forward. The results of the Company's mining operations to date for the current year show a substantial improvement over the results for the comparable period in the financial year under review.

AYER HITAM TIN DREDGING LTD.

The net profit for the year to June 30, 1961, is £377,434. Dividends totalling 1s. 3d. per share have been paid in respect of the year, and the Directors recommend payment of a Final Dividend of 9d. per share, leaving a balance of £104,384 to be carried forward.

During the current financial year, for the four months ended October 31, No. 2 Dredge has been running throughout, while No. 1 Dredge has been running for a few weeks only, but from now onwards we shall have the benefit of both dredges in operation.

Tin Research

I wish to mention the good work being done for the tin industry by the Tin Research Institute. I have previously referred to its work in connection with established uses such as Tin Plate, Bronzes, and Solder, but apart from its many other well-known and important activities, reference should be made to the new ground in tin research being broken by adapting recently devised techniques to the study of new tin alloys which are at present being evaluated. A special laboratory is devoted to the handling of a radioactive form of tin which gives new information on these alloys. It is expected that this information will lead to the possibility of including tin in a wider range of alloys than hitherto.

General

The Malayan Government can do much to aid both the short and long term development of the industry by the following measures:—

- Removal of restrictive conditions on mining wherever possible.
- Introduction of a co-ordinated land policy in regard to mining throughout the States of the Federation.
- Making more land available for prospecting.
- Speeding up the issue of Prospecting Permits and Mining Leases.
- A reduction in the Export Duty on Tin and an assurance that taxation generally as applied to mining will be such as to encourage production from low grade deposits.
- The further encouragement of research through increased financial support to the International Tin Research Institute.

MALAYAN TIN DREDGING AND SOUTHERN MALAYAN TIN DREDGING

The annual general meetings of Malayan Tin Dredging, Ltd., and Southern Malayan Tin Dredging, Ltd., were held on December 15 in London.

The following are extracts from the Statements of the Chairman Mr. F. G. Charlesworth:—

MALAYAN TIN DREDGING LTD.

After providing £369,054 for taxation the net profit is £421,050. The total dividend for the year is 2s. per share.

Although the ground treated by the dredges was nearly five million cubic yards more than that treated during the preceding year, there was a decrease in production of 731 tons of tin concentrates. This decline in production was due to a decrease in recoveries from the ground treated by No. 3A and No. 4A Dredges at Kampong Gajah. At June 30, 1961, the estimated average recoverable value of the ore reserves remaining in the undredged ground of this property was .436 lb. per cubic yard.

The three dredges at Kampong Gajah will, in the absence of unforeseen developments, be in full production throughout the current year, during which it is expected that the average recoverable value of the ground worked will be close to the estimated average over the property. If a fourth dredge is brought into production, the life of four dredges in continuous full production on this property will then be approximately 22 years.

It is expected that No. 6 Dredge, which is operating on this property in the old bed of the Kinta River, will work out the remaining undredged ground before the end of the current year. It is then intended that, after some limited im-

provements have been made to the digging equipment and treatment plant, this unit will test dredge part of an area of 560 acres which was worked by the Company's dredges before 1942 and which recent boring has proved to contain reasonable quantities of tin ore. If this test dredging is sufficiently promising, more comprehensive plans will be put into effect for the reworking of the whole area with No. 6 Dredge and possibly, after repairs and improvements, with No. 5 Dredge also.

We have been giving detailed consideration to the specification and plans for a fourth dredge on the Kampong Gajah property. The estimated cost of a new dredge of the size and capacity required, erected and ready to start operations, is nearly £1,500,000.

The outlook for tin producers is favourable. The trend of consumption is, as is to be expected with improving living conditions in all countries, upwards. The trend of production is, for the time being, downwards. This latter trend can be halted and indeed reversed but not, I believe, unless a steady tin price at a sufficiently attractive level to make the extraction of ore from low-grade deposits and high-cost mines economic, can be assured.

SOUTHERN MALAYAN TIN DREDGING LTD.

After providing £477,896 for taxation the net profit for the year is £738,683. The total dividend for the year is 4s. per share.

There were five dredges in full production on our Tanjong Tualang and Teja properties throughout the year. No. 5 Dredge was restarted at the beginning of March, and No. 2 Dredge was closed down for repairs and modifications to the treatment plant at the beginning of April this year.

The five dredges working at the beginning of the current year have continued in full production. The work on No. 2 Dredge has been completed and this dredge has recently been restarted.

Last year I stated that boring of the dredged ground at our Tanjong Tualang and Teja properties had disclosed a large area with extensive underlying areas of undredged ground below the digging depth of the operating dredges, which it might be profitable to rework with a deeper digging large capacity unit. We are satisfied, as a result of further investigation, that these dredged areas can be profitably reworked and that No. 5 Dredge can be suitably modified for that purpose. Our plans are to equip our Degong Road property with No. 6 Dredge.

It follows that we expect that five dredges will be in full production on our Tanjong Tualang and Teja properties during the whole of the current year and that, in the absence of unforeseen developments, five dredges will continue in production while the work of reconstruction and transfer of dredges is carried out.

The Castrol Group announce the formation of a new subsidiary company, Bladite, Ltd., which will specialize in metal cleaning by mechanical means, including shot blasting.

Robert Bruce & Sons, have placed an order with Heenan and Froude for a large Heenan P610 water-cooler for shipment to Emporor Mines. Fiji.

INSPECTOR OF MINES NORTHERN RHODESIA

Qualifications: Diploma or degree in Mining of recognized School of Mines or University, with at least five years experience, preferably in metalliferous mining industry, including knowledge of underground ventilation practice.

Age Limits: 25-45

Duties: Enforcement of Mining and explosives legislation, inspection of mines and accident investigation.

Terms of Appointment: On contract for a tour of 36 months in the first instance.

Emoluments in the scale £1,065-£2,245 plus gratuity of £37 10s. for each 3 months' satisfactory service. Free passages. Quarters at rental. Free medical attention. Generous leave. Taxation at local rates. Apply to Director of Recruitment, Department of Technical Co-operation, Carlton House Terrace, London, S.W.1, stating full name, age, qualifications and experience and quoting RC 242/108/01/H1.

THE CENTRAL PROVINCES MANGANESE ORE CO.

HIGHER SALES BUT LOWER PROFIT MARGIN

RENEWAL OF MINING LEASES—PROPOSED ARRANGEMENTS WITH INDIAN GOVERNMENT

MAJOR A. C. HERRING'S SPEECH

The 53rd annual general meeting of The Central Provinces Manganese Ore Company Limited was held on December 15 at Winchester House, Old Broad Street, London, E.C.2, Major A. C. Herring, V.C., F.C.A., the chairman, presiding.

Mr. Thomas Williams, A.C.I.S. (the Secretary) read the notice convening the meeting and the report of the auditors.

The chairman said:

Ladies and Gentlemen—The Report and Accounts for the year ended December 31, 1960, have been with you for the appropriate period and with your permission I will take them as read. (Agreed).

Before getting down to the business of the Meeting, I feel I must say a few words with regard to Mr. H. R. Holmes who retired from the Board on the 31 October last. I am sure the stockholders will regret the retirement of Mr. Holmes as much as we, his colleagues, do. His period of service with the Company covers 56 years, starting as a Mining Engineer and later as Managing Director and Chairman in London. At his request, I took over the Chairmanship in 1957. I have been a Director of the Company for over 20 years and during that period it has been my pleasure to meet Mr. Holmes at the Company's office most days of the week. I, therefore, can claim to know him well and in my opinion no Company has ever had a more loyal servant, nor have I ever had a better friend. He will be greatly missed at the office.

You will notice that we have appointed to the Board Mr. J. V. F. Crowther, F.C.A., who has done invaluable work for the Company in connection with the negotiations which have been taking place with the Government of India during this year. I am sure that he will be a valuable addition to the Board.

The Accounts

I will now deal with the accounts for 1960 which for reasons already explained have been unavoidably delayed. As will be seen from the Profit and Loss Account, the balance on trading for the year was £962,772 as compared with £1,066,885, whilst the net profit fell by £11,238 to £257,767.

We sold more ore in 1960 than in 1959, but unfortunately, due to a very ample supply of manganese ore in the world, and increased costs, the margin of profit was reduced. The actual tonnage of stocks on hand at the end of 1960 was very similar to that at the end of 1959. In view, however, of the falling off in demand, your Board considered it appropriate to write down the stock by a transfer of £200,000 from the ore stock reserve which now stands at £500,000. During the year it was necessary to sell some of our investments to finance the mining operations and discharge taxation liabilities.

The Current Year

So far as the year 1961 is concerned, it looks as though the volume of our sales will amount to a figure somewhat similar to that of 1960, but there has again been a further decrease in the margin of profit, and we expect that the result for 1961 will show a further reduction.

It is of interest to note that, whereas

in the past our sales of ore for consumption in India have been negligible, they have assumed a substantial level in 1960 and show a further advance in 1961. This is due to the fact that India now has several ferro-manganese plants in operation.

A great deal has been written in the papers about the recovery in the United States of America, but I regret to say that so far this has not resulted in an increased demand for our manganese ore. Among the reasons for this are the very large stocks of ore still held there and the supplies they are now receiving from new properties which have come into production and in which they are financially interested.

Mr. Hardy has paid visits to India in order to inspect the Mines and also to maintain our close collaboration with the State Trading Corporation of India. I am glad to report that he found the Mines in good condition.

Diamond drilling has been undertaken at Gumgaom and New Tirodi Mines and normal exploration work at Gumgaom and Ukwa Mines. The cutting of the ore bin on No. 6 level Holmes Shaft, Balaghat Mine is now in progress. The first level below plain level at South Tirodi Mine has been opened up disclosing that the ore bodies continue to be of very good quality. It was only found necessary to run the H.M.S. Plant at Dongri Buzurg Mine for 2½ months during the year. It has been maintained in excellent order. The re-opening of Beldongri Mine has continued satisfactorily and it will shortly be ready for production.

Proposed Arrangements with Indian Government

I now refer to the proposed arrangements which are under discussion with the Government of India. You will have seen from the circular letters of the 18 May 1961 and the 31 August, 1961, that certain difficulties had arisen with regard to the renewal of the leases of some of our properties. Some of those in the State of Maharashtra came up for renewal as at the 31 March, 1961, but the Government of India considered that, in the light of the Industrial Policy Resolution of 1956 and the amendments to mining legislation, the last of which was in November, 1960, it was not possible to grant renewals.

Your directors had been in close contact with Government officials concerning the leases for some time, but it was not until March, 1961, that your Company was notified that renewals would not be granted. It thus became essential to take immediate steps to establish an interregnum during which discussions might take place and this was accordingly done.

The position was one that could have been settled either by legal action in India or by an arrangement which would be satisfactory to your Company and to the Government. If the first alternative were adopted there is little doubt that the proceedings would be prolonged, perhaps over some years during which time the business of your Company would have suffered severely and, as a consequence, both parties would have been materially damaged.

It therefore seemed to your Board that your best interests would be served by

making an arrangement for the full use of the Company's assets through the joint participation by your Company and the Government of India in the manganese ore industry, particularly as the bulk of the remaining leases of the Company were due for renewal during the next 2 years.

I think it may be helpful to you if I expand the information contained in the Directors' Report. It must, of course, be appreciated that there are still many details to be settled before the terms of the proposed agreement can be put before you in full.

Disposal of Ore Stocks

The disposal of the existing stocks of ore for the benefit of your Company should result in a considerable amount of cash accruing, even after paying taxation on the profits on realisation.

The complete disposal of these stocks will take some years and will be dependent entirely upon the world demand for manganese ore, but it is evident that a considerable part of the stocks should be realised in the first year, provided orders are maintained, because the new rupee company will not have had the opportunity of delivering to ports the requisite amount of ore to cover the full year's operations. It follows from this that although your Company will collect cash from the sale of this ore, it is probable that the new rupee company will make profits in the first year or two at a rate lower than the profits from a normal year's working. Thereafter, if the manganese ore industry is prosperous and there is full co-operation between the rupee company and the Central Provinces Manganese Ore Company, the new company should be able to achieve satisfactory profits which will enable dividends to be paid to your Company on its holding of shares.

Your Company will be directly concerned with the sales organisation and co-operate in the management of the new rupee company. It is intended that the new company will employ in respect of the mining areas taken over the existing staff in India, and our Agent and General Manager is to be the first Managing Director of the new company.

I would again like to thank Messrs. James Finlay & Company Limited for their usual valuable co-operation.

I am sure you would wish me to convey to all our staff, both here and in India, your thanks for their unremitting good service during these difficult times.

Chairman's Retirement Foreshadowed

In conclusion, I wish to mention that in accordance with the views expressed to my colleagues some considerable time ago, I wish to retire from the Board, but I felt that I should not do so until arrangements with the Government of India had reached at least an advanced stage. I anticipate resigning in the near future. I would therefore like to take this opportunity of thanking my colleagues and the staff both in India and London for their loyalty and support which has always been forthcoming.

I am very pleased to announce that Mr. W. A. Hardy will succeed me as Chairman. Mr. Hardy joined the Company in 1923 and was Agent and General Manager for 6 years. He joined the Board in 1954 and has been Joint Managing Director since 1956.

I will now move "That the Report of the Directors and Statement of Accounts as at 31 December 1960 be and are hereby approved and adopted, and that the profits

be appropriated as recommended by the Directors".

I will ask Mr. Hardy to second the motion and before putting it to the Meeting will do my best to deal with any questions which stockholders may wish to ask.

Mr. W. A. Hardy seconded the resolution which was carried unanimously.

The retiring directors, Mr. J. V. F. Crowther, F.C.A., and Major A.C. Herring, V.C., F.C.A., were re-elected and the remuneration of the auditors, Messrs. Cooper Brothers & Co., having been fixed, the proceedings terminated.

THE LAMPA MINING COMPANY LIMITED

The Fifty-fifth Annual General Meeting of The Lampa Mining Company Limited was held on December 20 at Liverpool. Mr. G. Leo Carroll, O.B.E., the chairman, presided. The following are extracts from his report:—

Our profits are below those of a year ago. Grade of ore has dropped and the price of copper is lower. Against this may be set a further increase in output. The net results owe a certain amount to fiscal windfalls arising from previous years.

The board have decided to recommend a final dividend of 12½ per cent less income tax, making 20 per cent in all for the year. Our financial position is favourable and during the year fixed assets have been written down by as much as £28,144.

Last year I sounded a note of caution. We had enjoyed a record year and I doubted that 1960/61 could equal it. For the current year I feel I may sound a note of cautious optimism. I am hoping that the extra output as a result of the blowing in of the fourth furnace will make itself felt before the financial year ends. I also hope that the San Rafael flotation plant, which had barely started before June 30, 1961, will produce considerably more effect by June 1962. There are also, of course, possible adverse factors, some of which can be foreseen, others unforeseen, so it would be unwise to say more at the present stage.

We are a small company, but our stature has undoubtedly increased over the last ten years or more, and it has been due to our readiness to re-invest our profits in mechanizing, modernizing, and expanding our scale of operations. This is a continuous process. In the opinion of the board a company such as ours cannot afford to stand still. It must go on expanding or else it will start contracting.

The report and accounts were adopted.

In our Leading Note entitled "How Bullish are Silver's Prospects?" published in the December 8 issue, the figure recommended for release of silver to back the one-dollar silver certificates should have read 12,000,000,000 ounces, and not 12,000,000 as stated.

DAVIES INVESTMENTS LTD.,
Private Bankers (Gross assets exceed £2,500,000), are paying 7½% p.a. interest on deposits for the eighth year in succession, with extra ½% added annually on each £500 unit. Details and Audited Balance Sheet from Investment Dpt., M.N., Davies Investments Ltd., Danes Inn House, 265 Strand, London, W.C.2.

PAHANG CONSOLIDATED LARGER PROFIT

The 55th Annual General Meeting of The Pahang Consolidated Co., Ltd., was held on December 14 in London. Mr. J. N. Davies, chairman and managing director, presiding.

The following is an extract from his circulated statement:—

Your Board has pleasure in announcing a satisfactory result for the year ended July 31, 1961. The working profit for the year is £395,550 compared with £337,640 for the previous year. After providing for taxation and depreciation there is a net profit for the year of £222,583. Your directors recommend a final dividend of 1s. 3d. per stock unit (25 per cent.) making a total of 1s. 9d. per stock unit (35 per cent.) on the Ordinary Stock.

In the year under review, the last ten months of which were free of restriction, 197,000 tons of ore were mined, raised and treated to produce 2,411,059 tons of mill tin oxide as compared with 166,000 tons of ore and 2,252,524 tons of mill tin oxide produced last year. In the same period a return to alluvial production by tributaries was accomplished and 6,086 tons of alluvial tin were sold.

Considerable calls upon the Company's resources are likely in the near future. The Baker Shaft will involve considerable capital expenditure and if the possibilities at the Paloh Lode in Malaya and at the Cligga Mine area in Cornwall develop as we hope, further large sums will be required.

With this in view your Board feel it is essential to conserve our considerable liquid resources so as to be in a position to deal with these commitments.

The report and accounts were adopted and the re-election of Mr. G. H. Fairmaid, M.I.M.M., was duly passed.

Chairman's Additional Remarks

As you are aware, a Circular Letter has been received by some Members of the Company from three gentlemen resident in Singapore and Malaya in which support is sought for a plan to bring pressure upon your Board to influence a change in its present policy and to obtain the appointment of two Malayan Directors on the Board. A copy of this Circular Letter is available for any Member wishing to see it.

Nominations were also received for two gentlemen to be elected to the Board, but these nominations did not comply with the Company's Articles of Association and your Board was advised by Counsel that the nominations were invalid.

The Board are very grateful to Members for the response received to the Circular Letter of December 1, 1961. 1,635 valid proxies, representing 1,705,723 votes, have been lodged in favour of the Board; 14 valid proxies representing 185,500 votes have been lodged in favour of other persons. 108 proxies, representing 405,100 votes, were also lodged in favour of other persons but they were lodged within the 48 hour period and so were not valid. Even if we include the proxies lodged out of time, it will be noted that 1,635 Members supported the Board and only 122 Members supported other persons and that 1,705,723 votes were lodged in favour of the Board as against 590,600 in favour of other persons.

To conclude these additional remarks, I now give details of today's market value of the Company's investments:—

Government Securities	£577,563	82%
Investment in other		
Tin Companies	£77,032	11%
Industrial Equities	£48,473	7%
	<u>£703,068</u>	<u>100%</u>

WITBANK COLLIERY, LIMITED

(Incorporated in the Republic of South Africa)

Extracted from the ANNUAL REPORT for the year ended 31st August, 1961

Working Profit	R 820,501	
Add Sundry Revenue, less Expenses	13,733	
	<u>834,234</u>	
Taxation	216,437	
Profit after Taxation	617,797	
Balance of Income and Expenditure Account at 31st August 1960	755,426	
	<u>1,373,223</u>	
Dividends declared—Nos. 109 of 13c and 110 of 14c per share	415,800	
Transfer to Capital Reserve—net expenditure on mining assets less realisation of trade investments	18,903	
	<u>434,703</u>	
Balance of Income and Expenditure Account at 31st August, 1961		<u>R938,520</u>

The coal despatched from the mine amounted to 1,935,760 tons which, despite a slightly lower demand for tonnage from the Southern Section, exceeded the total for the previous year by 134,562 tons.

In the Directors' Report last year it was mentioned that capital expenditure during the year ended 31st August, 1961, would include an estimated R70,000 to be spent on the modernisation of the underground electrical switchgear in accordance with the requirements of the Mines Department. This work is in progress but on reconsideration of the matter, expenditure is being charged, more appropriately, to working costs and not to capital.

It is estimated that capital expenditure during the twelve months ending 31st August, 1962, will amount to approximately R70,000 and will be incurred mainly on the purchase and erection of a conveyor structure and ancillary equipment for the dumping and reclamation of fine coal, on an additional vibrating feeder for the Wolvekrans coal preparation plant, and possibly on drilling south of the Oilfants River.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO. LIMITED, 4, London Wall Buildings, London, E.C.2.

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*This feature appears every fourth week***PERSONAL**

Mr. K. E. Browning, Chief Training Executive of the Dowty Group Ltd., has been appointed a director of D. G. Services Ltd. He will continue to be responsible for all training and educational facilities in the Group.

*

Mr. Joseph Samuels has been appointed managing director of Winston Electronics, Ltd. after serving on the board for six years. Mr. W. Allan Bridges, the former managing director, continues as chairman of the board.

*

Mr. W. H. Spiers has been appointed manager, London office, for Caterpillar Tractor Co. He will be responsible for work connected with government departments and with international contracting companies.

*

The Ore Mining Branch of The United Steel Companies announce the following appointments. Mr. F. Ibbotson, formerly manager of Dragonby mine, becomes assistant group manager, underground mines. Mr. T. P. S. Baxter, manager of Santon mine, succeeds Mr. Ibbotson. Mr. J. Darragh, becomes manager and Mr. A. S. Martin, undermanager, of Santon mine.

*

Croft (Engineers) announce with regret the death of Mr. N. Finch, their Leeds Area Manager at the age of 41.

As part of a concentrated programme to expand, co-ordinate and strengthen Harnischfeger sales and service the Harnischfeger Corporation have announced the following staff changes—Mr. G. T. Raubach has been appointed manager of the mining excavator division, Canada. Mr. J. H. Taylor will be mining excavator sales manager for the Western region and Mr. C. A. Magnusson is the new district manager in the Pittsburgh office.

*

Mr. William B. Stephenson, president of Allen-Sherman-Hoff Pump Co., has been elected 1962 president of the Society of Mining Engineers of AIME.

*

Mr. E. D. Sutcliffe has been appointed chairman of the Richard Sutcliffe Board. Mr. W. F. G. Sutcliffe, who remains managing director, has been appointed deputy chairman and chairman of the Sutcliffe Moulded Rubber Co. Ltd. The general manager of Richard Sutcliffe Ltd. Mr. M. Reid Moore, has been appointed to the Board.

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Mr. R. J. Sutcliffe has been appointed president of Richard Sutcliffe Ltd. and the Sutcliffe Moulded Rubber Co. Ltd. He was formerly chairman of the Board of each of these companies and remains chairman of Sutcliffe Engineering Industries Ltd.

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